



Ars Medica

MEDICAL ILLUSTRATION THROUGH THE AGES

An Exhibition to Commemorate the Seventieth Anniversary of the Founding of
Associated Medical Services



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Exhibition and catalogue by Philip Oldfield and Richard Landon
Preface by Dr. William E. Seidelman

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Foreword

It is a privilege and a pleasure to participate in the celebrations marking the seventieth anniversary of Associated Medical Services. The relationship between AMS and the Thomas Fisher Rare Book Library goes back to 1973 when the Hannah Collection arrived, and this exhibition and catalogue tell part of the story of its evolution and growth over the intervening thirty-two years. The steadfast support of AMS has been of crucial importance for the growth of this great research resource.

We could, of course, only display a small number of the books in the Hannah Collection, and Philip Oldfield and I decided to feature illustrated works, the *ars anatomica*, because of their visual appeal for a wide general audience. These examples also demonstrate the high levels of design and printing that have been achieved over the past five centuries and thus contribute to our appreciation of the history of the book, an underlying theme of all our exhibitions and a focus of study at the University of Toronto.

Our greatest appreciation is extended to AMS and its Director and C.E.O., Dr. William Seidelman, who has written an introductory history of the organization for this catalogue. AMS has also funded the catalogue and we wish it a very happy anniversary. May it continue to make a "healthy contribution."

Richard Landon,
Director

*Seven decades of “Making a Healthy Contribution”
to Canadian Society:*

A history of AMS, 1937-2006

Associated Medical Services (AMS) is an innovative Canadian charity that is celebrating seven decades of contribution to health and health care in Canada. Incorporated in 1937, AMS was Canada’s first non-profit, prepaid health care organization to be sponsored by physicians. With the introduction of universal health insurance in Canada, AMS became a charitable organization with a major focus on support for the development of scholarly activities in the history of medicine. AMS charitable activity has since expanded to encompass bioethics and the education of health professionals in Canada. In all of these efforts AMS has been a pioneer in advancements in health and health care in Canada, creating a model for innovation in other parts of the world.

AMS and Health Care

As a health care organization, AMS represented the vision of its founder, Dr. Jason Hannah. Dr. Hannah’s ambition for private prepaid health care was shaped by his experience as a physician in the employ of the Ontario Civil Service during the Great Depression. His principal objective for AMS was to provide quality prepaid medical services at the lowest possible cost on a non-profit basis. A fundamental principle of Dr. Hannah’s vision for prepaid health care was that it be provided by an independent non-profit organization, whose subscribing members would be able to choose their own personal doctor in private practice. These ideas took shape through Dr. Hannah’s relationship with the Ontario Civil Service Association and in consultation with the Toronto Academy of Medicine. A critical factor in Jason Hannah’s idea of free choice of provider was its acceptability to a medical profession that feared a prepaid system would restrict the ability of patients to choose their own doctors. Applicants for membership in the AMS plan had to provide the name of a private practitioner who would be the designated care provider.

Another unique aspect of Hannah’s vision for AMS was that it allowed for individual as well as group subscription. In Jason



Dr. J. Hannah at the podium at the official opening of the Hannah Collection, Fisher Library, March, 1974.

Hannah’s words, “Shopkeepers, farmers and others will have to be cared for and they would find it difficult to be in groups.”

AMS could not have been established without the engagement of the Ontario Medical Association (OMA) which provided support to AMS upon its formation. The relationship between the OMA and AMS was ambiguous. While the OMA approved of AMS, providing financial support through a loan, there was a general concern amongst the medical profession about the rise of prepaid health care, as well as an emerging public and official interest in government involvement in health care. As AMS grew, the OMA became concerned about the lack of an OMA presence on the governing Board of Directors. Dr. Hannah resisted OMA control, but ensured that a majority of the members of the Board of Directors were physicians. In addition, AMS agreed to the appointment of two OMA representatives to the AMS Board who would serve in a “liaison, consultant and advisory role.” The \$3,800 loan provided to AMS by the OMA was repaid in full in 1939.

The OMA decided to establish a new prepaid health care plan known as Physicians Services Incorporate (PSI). While separate from the OMA, operational control of PSI rested with the medical profession of the province. PSI commenced operations in 1947, quickly surpassing the number of AMS subscribers. The operational model for PSI was based on that of AMS, but emphasized group enrolment over that of single and family subscribers. Another prepaid medical plan that paralleled AMS was Windsor Medical Services (WMS) which was established with the financial support of physicians in the Windsor area.

AMS was successful from the start and by its tenth anniversary, had 43,000 subscribers. Much of that success can be attributed to the careful management of all aspects of the organization's operations. Special attention was given to the control of administrative expenses through the use of the latest data processing technology including the innovative "punch card" systems of the 1950s.

Dr. Hannah saw AMS as an "experiment", which might provide a better understanding of health services, and develop a capacity for health care planning. He was prepared to make available AMS health service data for such research. Dr. Hannah promoted the AMS vision for prepaid health care through symposia, known as the "Mazinaw conferences," held at his country retreat on Lake Mazinaw.

The postwar period saw increasing public interest in the involvement of government in health care insurance. Spearheading this movement was the socialist government of the province of Saskatchewan. Federal government involvement in payment for health care services across the nation began in 1957 with a national hospital insurance plan that the province of Ontario joined in 1959. In 1961 the Federal Government appointed the Royal Commission on Health Services under Justice Emmett Hall. On May 8, 1962, Dr. Jason Hannah, on behalf of AMS, presented a written brief promoting the AMS as a successful example of a private prepaid health care organization. Dr. Hannah predicted that under a government plan there would be inadequate control over costs, and that health service utilization, together with costs, would escalate. The Royal Commission Report which recommended a national program of universal health insurance was tabled in 1964, and the federal government and the provinces moved quickly to implement it, Dr. Hannah's prescient warning notwithstanding.

In 1969, the government of Ontario joined the national program. The provincial government asked the three non-profit prepaid plans (AMS, PSI and WMS) to work as a consortium with the government in preparation for a single health insurance plan to be administered by the province. PSI and WMS declined. PSI became a private foundation using earnings from its financial reserves to support medical education and research in Ontario. WMS distributed its reserves to the physicians in Windsor and Essex regions who had provided financial support for its launch.

On October 1, 1969, AMS ceased to function as a provider of prepaid health care services to its quarter of a million subscribers.

In contrast to the other prepaid plans, AMS became an agent of the government of Ontario in the collection of health insurance premiums, and the assessment of claims and payments under the provincial plan. Payments were made by a cheque with the imprint: "Associated Medical Services, Inc. and Ontario Health Services Insurance Plan of the Ontario Department of Health." AMS continued as an agency of the provincial government until July 1972, when the agreement with the government came to an end, and AMS was terminated.

After the Arrival of Medicare

While Jason Hannah eschewed the term "insurance", AMS did in fact guarantee payment for health services provided to its subscribers. As an insurer of health services, AMS was required to have a reserve fund to protect against a possible run on its resources in the case of a disaster or an epidemic. By 1972, when AMS ceased operations as a government agency, the AMS reserve fund stood at \$ 12,608,114. This reserve fund became the foundation upon which AMS the charity was to be constructed. It derived from fees paid by subscribers. The management of the fund became an important determinant of the future of AMS. With the discontinuation of AMS's function as a non-profit prepaid healthcare organization, its status as a tax-exempt entity came under the scrutiny of the financial and tax authorities.

In anticipation of the arrival of medicare and a new role for AMS, Dr. Hannah and the Board considered a number of options for future endeavour. These included a model clinic incorporating a group practice linked with a hospital. Another possibility was a prepaid drug plan which would be built on the experience of AMS in prepaid health services. A drug plan was instituted in January 1969 but discontinued three years later because of financial losses. Involvement in nursing homes was also considered but never came to fruition.

On the occasion of the twenty-fifth anniversary of AMS in 1962, and as a potential memorial to Dr. Hannah, the Board of Directors authorized a donation to Queen's University "...as a contribution to assist the medical research programme at Queen's University at Kingston, Ontario, through the establishment of a Medical Library to bear the name of Dr. J. A. Hannah and in which continuing provision would be made for a suitable display and endowment of objects of historical medical interest."

The 1960s and 1970s saw Dr. Hannah become increasingly preoccupied with his, and AMS's, legacy. Dr. Hannah's growing awareness of his own mortality, which had been brought to the

fore by physical impairments requiring surgery, and ultimately, frequent blood transfusions, was certainly one factor in this shift in focus.

The change in tax status and the management and disbursement of the reserve fund was a concern for members of the Board of Directors who began to confront Dr. Hannah's heretofore unchallenged leadership of AMS. The two directors who played a significant role in addressing this issue were Dr. John Deutsch of Queen's University and Dr. John Neilson. Dr. Deutsch's term on the Board, although curtailed by terminal illness, was pivotal in the affairs of the corporation, and motivated a new approach to fiscal management. Dr. Neilson, who eventually succeeded Dr. Hannah as President, brought a business-like approach to the corporate affairs and management of AMS during the period of transition from prepaid medical care provider to charitable organization.

In 1975 AMS engaged a legal expert in charities, Mr. John Hodgson, Q.C., of the law firm Blake Cassels to address the question of AMS's tax-exempt status. As result of Mr. Hodgson's efforts, in July of 1976 AMS was registered under the Income Tax Act as a charitable organization with responsibility for the security of the reserve funds resting with the Board of Directors.

Dr. Boyd Upper played a key role in the management of the reserve funds. His association with AMS was the longest of any person. He had been a member of the AMS staff, serving as the Chief Medical Officer during the last decade of AMS operations as a health care organization. He subsequently served as a member of the Board of Directors and as Vice-President and President. During his years on the Board of Directors, Dr. Upper skilfully managed AMS investments and was largely responsible for the enhancement of the corporation's capital.

John Hodgson continued as AMS corporate counsel until his retirement from active practice in 1997.

AMS and Jason Hannah

Whereas Jason Hannah pursued his vision of prepaid medical care with a singular determination and purpose, the quest for a legacy in medical history was marked by uncertainty and confusion. Hannah was a visionary pioneer and a peerless expert on the subjects of prepaid health care and the economics of health services. With the end of AMS involvement in prepaid health care, the future of AMS was uncertain, and neither Jason Hannah nor the Board of Directors had a clear perception of a new direction.

The twenty-fifth anniversary of AMS and the possible acquisition of a major collection of historical books to be housed at Queen's University appear to have triggered Dr. Hannah's interest in medical history. The 1960s and '70s saw a number of attempts at acquiring historical medical book collections. They also saw the genesis of the idea of an institute for the history of medicine, and the establishment of chairs in the five Ontario faculties of medicine. In actual fact AMS acquired the books before they had a library to house the collection. Moreover it proposed an institute without having defined what the functions of such an institute should be.

Jason Hannah had little experience or knowledge of medical history or the workings of academia. Furthermore, as someone who founded and ran AMS as a personal endeavour, he was reluctant to dispense with AMS wealth or share control with another organization such as a university or other institution. He envisioned the establishment of an institute to be named after him, which he would lead and control. While funds would be spent on chairs in the history of medicine, control over the chairs would rest with Jason Hannah and the eponymously named institute.

Dr. Hannah obtained the counsel of historians of medicine to provide guidance in the area. Dr. William Gibson of the University of British Columbia is an enthusiastic champion of the subject with international connections in the field. Dr. William Swinton was an historian of science at the University of Toronto who provided valuable ideas as well as local contacts with the university and Massey College. The neurologist Dr. John Scott was a local history enthusiast who taught the subject in the Toronto medical faculty and was an active member of the Toronto Academy of Medicine.

It was Dr. Gibson who alerted Dr. Hannah to the availability of historical collections, the first being that of the Royal Society of Medicine in Edinburgh. While negotiations for the purchase of the Edinburgh collection were unsuccessful, a collection was eventually purchased from the Medical Society of London, and had to be stored in different places while Hannah sought a permanent home for the books and the Institute.

Dr. Hannah's idea of a central library expanded to that of an institute for the history of medicine. Discussions of a library and institute were held with Massey College and the Toronto Academy of Medicine. Negotiations with Massey College included consideration of the construction of a Hannah Tower at the college. Discussions with both institutions faltered and came to naught. Eventually the library collections, which included a second library from the Medical Society of London, a collection from Dr. Thomas Lambo of Geneva, and the Rucker

Library in obstetrics and gynaecology were deposited with the Thomas Fisher Library of the University of Toronto and are known as the Hannah Collection. AMS continues to provide the Hannah Collection with financial support for maintenance and acquisition.

The years 1972 and 1973 represented a period of critical transition, during which AMS support for scholarly endeavours was implemented. After discussions involving the five Ontario medical faculties, their parent universities and the Council of Ontario Faculties of Medicine, agreement was reached for the establishment of the Hannah Institute for the History of Medicine and a Hannah Chair in the History of Medicine at each of the Ontario medical schools. In 1973, the first application for a Hannah Chair in the History of Medicine was received.

The Jason Hannah Institute for the History of Medicine was inaugurated by AMS and housed temporarily at Massey College where Jason Hannah had been appointed a Fellow and had offices. Dr. Hannah was the first director of the Hannah Institute and the sole staff member. It was decided to fund chairs in the history of medicine by means of an annual grant to the five universities, with *de facto* accountability and control resting with the Hannah Institute and Jason Hannah. Another eponymous honour initiated by AMS was that of the Jason Hannah Medal for an outstanding publication in the history of medicine by a Canadian to be awarded annually by the Royal Society of Canada along with a monetary gift.

AMS activity in the history of medicine began to solidify in 1975 with the engagement of Dr. Pat Paterson. Initially employed as Dr. Hannah's assistant, Dr. Paterson became the first Executive Director of the Jason Hannah Institute for the History of Medicine. Dr. Paterson's background in pharmacy, the history of pharmacy and academia qualified him for the role. In addition to wide knowledge in the fields of the history of science and medicine, Dr. Paterson had a strong personality, enabling him to work with Dr. Hannah and to be the leader of the nascent Hannah Institute.

Jason Hannah Professors of the History of Medicine were appointed at each of the five Ontario medical faculties. Libraries were established. Grant requests for research in medical history and publications in the subject were reviewed by AMS/Hannah committees, with recommendations to the AMS Board for final approval. Conferences as well as student teaching in the subject were encouraged and supported. The Canadian Society for the History of Medicine became a national organization. Under the leadership of Dr. Peter Cruise at the University of Calgary and the Royal College of Physicians and

Surgeons of Canada medical students were involved in preparing and presenting papers on the subject at annual conferences in Calgary and with the Royal College.

Jason Hannah's final days with AMS were difficult. In failing health, he and the Board of Directors came to a parting. His official role with AMS ended with his resignation from the AMS Board of Directors in December, 1975. He died sixteen months later on May 2, 1977. Despite this unfortunate conclusion, the enduring legacy Jason Hannah left behind is far greater than he could have imagined.

AMS, the History of Medicine, and Medical Education

In the three decades since AMS first became involved in supporting the history of medicine in Canada the field has grown and matured significantly. Scholars working in the field are to be found at colleges and universities across the country. Medical history is now accepted in the academic mainstream of Canadian colleges and universities.

The maturation of the history of medicine brought with it expected, and unexpected, growing pains. Hannah professorships at five universities were funded by AMS and subject to periodic external review by AMS/Hannah. While the review was theoretically the responsibility of the parent university, in reality it was strongly influenced by AMS and the Executive Director of the Hannah Institute. Hannah professors, because they were supported by AMS "soft-money," were not usually eligible for tenure. The professors were accountable to two masters: the university at which they were appointed, and the Hannah Institute that controlled the funding. This situation placed the professors in a situation of conflict. The solution was for AMS, in partnership with the universities, to endow the five chairs. The AMS policy on endowment of the chairs was developed and led by the eminent Canadian historian and member of the AMS Board of Directors, Professor Ramsay Cook. The process was completed in 2003 with the endowment-in-perpetuity of the Hannah Chair at the University of Ottawa.

The establishment of the history of medicine as a national scholarly endeavour obviated the necessity for AMS to continue an intramural history of medicine program. With the endowment of the five Hannah chairs, there was no reason for the continuation of the Hannah Institute, which was closed down. Jason Hannah's dream for the history of medicine had been fulfilled beyond anyone's expectations, and a separate institute or "system" was no longer required. The closure of the Hannah Institute enabled AMS to consolidate its administrative operations and potentially make more funds available for the support

of scholarly activity. As of 2005 AMS competitive grants in the history of medicine (Hannah Grant-in-Aid) are being partnered with the Canadian Institutes of Health Research (CIHR). AMS, in partnership with the University of Ottawa has established the AMS History of Nursing Research Unit, the first of its kind in Canada. Discussions are presently underway with Ontario hospitals to encourage hospitals to save their records and develop institutional archives.

In the 1980s, under the leadership of Dr. Donald Wilson, AMS charity extended to medical education, with a new undertaking known as Educating Future Physicians for Ontario (EFPO) that was based on making undergraduate medical education in Ontario more responsive to the changing needs of society. EFPO was undertaken in partnership with the five Ontario medical faculties and the Government of Ontario. An enduring emanation of the EFPO is the CanMEDS initiative of the Royal College of Physicians and Surgeons of Canada that was also supported in its early stages by a grant of \$500,000 from AMS. AMS also undertook to support an innovative programme in health sciences libraries known as the Coalition of Academic Health Sciences Libraries (COAHL). At the time of the inception of EFPO, faculty development in the area of medical education was not well supported. With the cessation of EFPO in 1998 AMS undertook to provide grants in support of innovation in medical education that were adjudicated by an AMS education committee. In reality, as in the case of the history of medicine program, research and support for medical education had expanded considerably, and an AMS contribution of competitive grants in medical education was no longer required. The education focus shifted to a dedicated initiative on palliative care education ("AMS Educational Fellowship in Care at End of Life") in partnership with the five Ontario faculties of medicine and the Council of Academic Hospitals of Ontario.

Under the guidance of Professor Abbyann Lynch, who served as the fifth president of AMS, support was provided for the development of academic programs in bioethics, which helped to establish that discipline in medical faculties throughout Canada, as well as encourage teaching and research in that subject area. AMS support for bioethics has continued with competitive grants for research, an internship for bioethicists from a non-clinical background, and professional development for clinical bioethicists, as well as summer studentships. In 2002 AMS, together with the Royal Society of Canada, established the Abbyann D. Lynch medal for an individual who has made a singular contribution to bioethics in Canada.

Today AMS charity is recognized both nationally and internationally as making a contribution towards the advancement of scholarly activity in the history of medicine and health care, bioethics, and health professional education.

Jason Hannah's Legacy

Jason Hannah would not have been at all surprised by the current problems of Canada's system of government-sponsored prepaid health care, problems he had predicted forty years previously. The current challenges have resulted in renewed interest in Dr. Hannah's original idea of prepaid non-profit health care.

It is doubtful whether Hannah could have anticipated the success of the history of medicine and the pervasive impact of the Hannah chairs, the Hannah medal, Hannah grants, Hannah conferences, and the Hannah Collection housed at the Fisher Library, that have resulted in worldwide recognition of Canada's prominence in the field of medical history. His concept of a central library has been supplanted by modern technology that enables items from the Hannah Collection to be made available to students and scholars around the world via the World-Wide-Web.

Jason Hannah would be pleased by the realization of his vision of using health data for planning health services. Today health economics and health care planning are recognized disciplines that are an important part of the health care system.

Because of Jason Hannah's vision and leadership, AMS has had a seven-decade history of innovative achievements in health care, education, scholarship, and philanthropy, with the overall goal of making a healthy contribution to Canadian society.

William E. Seidelman MD, FCFP
President and CEO
Associated Medical Services, Inc.
December 2005.

Author's note

This summary account of AMS focuses on critical events. The principal source is *Associated Medical Services, Incorporated: A History* by John B. Nielson and G. R. Paterson (Toronto: Associated Medical Services, 1987). Regrettably, many individuals who played an important part in the development of AMS could not be included in this brief rendition.

The Hannah Collection in the History of Medicine and Related Sciences

The Foundation Collection

In 1968 Dr. Jason A. Hannah, the President and Managing Director of Associated Medical Services, visited the Woodward Library at the University of British Columbia and met Dr. William Gibson. Dr. Gibson was, and is, a dynamic advocate of the study of the history of medicine who had established an important and attractive collection of books and manuscripts there. Upon viewing the handsome room and some of the books, Dr. Hannah was reported to have said, "How much did this cost? I want one of these." An answer was soon forthcoming as the Royal Society of Medicine of Edinburgh was in the process of preparing to sell its historical collection of books through Sotheby's of London and Dr. Hannah did make an attempt to pre-empt the sale. His offer, however, was too little and too late and the Edinburgh books were sold by auction.

In the Spring of 1971 another opportunity presented itself. Dr. Gibson was in London and was told that the Medical Society of London was planning to sell, through Sotheby's, some 2000 volumes of its collection of rare books, but was willing to consider a pre-sale offer for the lot. Dr. Gibson telephoned Dr. Hannah, who was vacationing in Florida, and he decided, more or less on the spot, to make an offer on behalf of AMS. The asking price was substantial, but it must be acknowledged that there is more than one book in the collection that would bring the total price at auction by itself today. When the books duly arrived in Toronto they were unpacked and listed at the Academy of Medicine and it was discovered that some were missing, misplaced by Sotheby's. But some of them were eventually recovered and the final price was adjusted accordingly. Another, smaller, collection was purchased from the Medical Society of London in 1972 and it too was placed on deposit in the Academy of Medicine. What was not explicitly made known was that in 1967 some 10,000 volumes were selected from the Medical Society's library for deposit in the Wellcome Institute

for the History of Medicine, which, of course, included many of the most desirable items, including the medieval manuscripts, fifteenth-century books, and many of the early works in English.

The ultimate destination of the Hannah Collection remained unclear for some time as, apart from the Academy of Medicine itself, Queen's University (Dr. Hannah's *alma mater*), Massey College, the National Library of Canada, and the offices of AMS on Yonge Street were all discussed. In 1973, however, negotiations were commenced with the University of Toronto Library and it was decided that the collection should be permanently housed in the newly-completed Thomas Fisher Rare Book Library. Its official opening occurred in March 1974. AMS also provided funding for a cataloguer, for continued acquisitions, and for physical maintenance. The acquisition fund has continued on an annual basis for thirty-two years and has enabled the Fisher Library to develop and expand the collection in several significant ways.

In 1974 the first of two collections belonging to Dr. Thomas Lambo, Deputy Director-General of the World Health Organization, was purchased by AMS and added substantially to the scope of the Hannah collection, especially in the fields of psychiatry and nineteenth-century physiology. There had been established a consultative process for acquisition of collections by Dr. G.R. Paterson, who had been appointed Assistant to Dr. Hannah in 1974. Shortly after this the Rucker Collection of gynecology and obstetrics was purchased from the New York antiquarian firm of Henry Schuman, adding yet another dimension to the library and these five collections constituted the formation of the Hannah Collection.

The other important addition to the collection was already there: the works of medical history that were part of the University Library's special collections, including the 1543 first edition of Vesalius. The emphasis on graduate studies and research at the University of Toronto, beginning in 1960 with the installation of Claude Bissell as President, meant that the library system came under increasing pressure to provide resources in support of this ambitious programme, especially in the humanities. The creation of interdisciplinary institutes and centres also changed the nature of the development of special collections and the Hannah Collection provided a wonderful example of an important response to an urgent demand. In 1965 the Institute for the History and Philosophy of Science and Technology was founded and the library was asked whether its resources were adequate to support the research of graduate students at the masters and doctoral levels as well as post-doctoral and faculty needs. A survey revealed the inadequacy of the collections and central administration support was provided to remedy the situation for both the history of science

from the medieval to modern periods and for the history of medicine from the texts of ancient Europe and Asia to the early twentieth century. Medicine was an integral part of the purview of IHPST and, indeed, the first Hannah Professor of the History of Medicine at the University of Toronto was appointed within the Institute. The Science Collection grew quickly through purchase and gift while the Hannah Collection provided a medical counterpart, with the University collections adding strength in areas such as dentistry and pharmacy. More recently, the rare book collections from the Academy of Medicine have been acquired, including the T.G.H. Drake Collection in the history of pediatrics, a perfect complement to the Rucker Collection.

All this has been accomplished in a relatively short period of time. Today there are three great collections in the history of medicine in Canada: the Osler Library at McGill University, the Woodward Library at the University of British Columbia, and the Hannah Collection at the University of Toronto.

The Medical Society of London Collection

The Medical Society of London was founded in 1773 by John Coakley Lettsom (1744-1815), a Quaker physician and philanthropist whose intention was to unite into one general society what were then the three distinct branches of physicians, surgeons, and apothecaries. It remains the oldest surviving society of its kind in London. Lettsom amassed a considerable fortune through his extensive London medical practice and was an avid supporter of many types of organizations, including the General Dispensary, the Royal Humane Society, and the Royal Sea-bathing Infirmary. He was elected as a Fellow of both the Society of Antiquaries and the Royal Society. He was also an important collector of books, his own library reaching some 12,000 volumes. He and the other founders of the Medical Society of London considered that one of the most important functions of the Society was the provision of a library and by 1790 it had over 10,000 volumes, acquired through purchase and gift. In 1800 it bought the collection of its then President James Sims, about 6,000 volumes of early printed books and manuscripts which provided much of the strength of the rare book portion of the library. Lettsom was forced by financial setbacks to sell his own collection at auction in 1811 and more were sold in 1816, after his death. He had, however, made some substantial donations during the previous decades and the Society bought books at both sales. Its library continued to grow throughout the nineteenth century, its last major acquisition being the bequest of 2500 volumes from the collection of Lord Lister in 1912.

The two accessions from the Medical Society contain a considerable number of the most important texts for the study of medical history. The 1525 Latin *Works* of Hippocrates, the “Father of Medicine”, includes the famous *Aphorisms* – “art is long, life is short” and “desperate diseases require desperate remedies” – and is complemented by Thomas Linacre’s edition of Galen’s *Methodus medendi*, published in Paris in 1526. This voluminous collection of medical texts, written in the second century A.D., remained the authoritative resource for almost 1500 years and continued to be influential well into the nineteenth century. The Vesalius of 1543 was already in the University’s collection, but the Society’s library added something much rarer, a 1552 small format students’ edition, pirated in Lyon. Another rare unauthorized edition, published in Venice in 1568 contains woodcut illustrations slightly reduced from the 1555 folio edition. It is followed by a 1566 edition of the *De re medicina* by Aulus Cornelius Celsus, an aristocratic Roman known as “Cicero Medicorum” because of the purity of his Latin. It was composed about 30 A.D. and of the seventy-two medical authors cited by him only the works of Hippocrates survive. Albucasis (936-1013) was a native of Cordova who compiled the most complete collection of surgical texts of the medieval period. The 1541 edition of his *Methodus medendi certa* is but one example of the preservation of texts through Islamic sources. Thomas Geminus, an engraver, introduced Vesalius to England in 1545 with his *Compendiosa totius anatomie delineatio*, an abridgement of the text with illustrations printed from copper plate engravings. The 1559 third edition has on its title-page the earliest depiction of Elizabeth I after she became Queen. It also included two “fugitive leaves”, the rare multi-layered flaps used to demonstrate anatomy during the 16th century.

The great and familiar works continue through the centuries in first and early editions: the anatomical works of Gabriele Falloppio, who was a student of Vesalius and gave his name to the Fallopian tubes; his student, Girolamo Fabrizio, whose *Opera anatomica* of 1625 includes his two works on embryology, *De formato foetu* and *De formatione ovi et pulli*; and the enormously influential work on the circulation of blood by his most famous student, William Harvey. The greatest surgeon of the sixteenth century was Ambroise Paré, whose works, originally published in French, were translated into English in 1634 and went through several editions. Thomas Bartholin made major contributions to Danish medicine with his *Anatomia* of 1655 and his later works were edited by his son, a professor of mathematics and medicine. In England Richard Lower continued the research of Harvey with his *Tractatus de corde* of 1669; and in Italy Marcello Malpighi, the founder of histology, refined and extended Harvey’s work on embryology with his *De Formatione pulli in ovi* (1673), the first work to describe a chick embryo

using a microscope. Rene Descartes' *De homine figuris*, in its first Latin edition of 1664, is regarded as the first European textbook on physiology. The magnificent 1683 *Anatomia humani corporis* by Bidloo and Remmelin's *Catoptrum microcosmicum* (1639) present anatomy as baroque art.

Anthony van Leewenhoek is usually associated with the development of microscopes, and he constructed 247 of them during his long life. He was also the first bacteriologist and his *Arcana naturae*, a collection of his most important papers, was published in four volumes between 1695 and 1719. Giovanni Battista Morgagni, the founder of pathological anatomy, published *De sedibus* in 1761, based on 640 post-mortem examinations. The science of dentistry was founded by Pierre Fouchard with his *Le chirurgien dentiste* of 1728 and continued by John Hunter's *The Natural History of the Human Teeth* (1778). Hunter also published works on pathology and his equally famous brother, William, contributed the magnificent *Anatomia uteri humani*, printed by John Baskerville in 1774. Hermann Boerhaave was known as the "Bavarian Hippocrates" and his *Aphorismi* of 1728 directly influenced his greatest student, Albrecht von Haller, the notable physiologist, anatomist, botanist, and poet. Haller was also the founder of medical bibliography. There were many famous doctors in 18th-century Britain, the most renowned being Richard Mead, who wrote many books, was the physician to Queen Anne, George I, George II, Sir Robert Walpole, Sir Isaac Newton, and Bishop Burnet, and, according to Dr. Johnson, "lived more in the broad sunshine of life than almost any man". He was also a great collector of books and manuscripts.

A whole section of the Medical Society collection contains works on plagues. Thomas Cogan's *The Haven of Health*, first published in 1584, advises people to "fly quickly from the place infected". There is a large literature on the Great Plague of London in 1664/5, including many pamphlets, bills of mortality, and more substantial works, like Nathaniel Hodges' *Loimologia* of 1672, the most accurate medical record of the period. There are also numerous herbals, including John Gerard's of 1597 and the first Canadian flora, Jacques Philippe Cornut's *Canadensium plantarum historia* (1635). All these books, acquired by Dr. Hannah from the Medical Society of London, have provided a very strong base upon which to build the collection.

The Lambo Collection

The two Lambo collections were quite different. In fact, the most valuable single item was the 1505 Zamberti translation of Euclid which had been translated from a Greek manuscript and

greatly improved the standard Latin text of Campanus. This rare edition, an example of a related sciences text of the Hannah Collection, filled a gap in one of the most important Euclid collections in North America. The first Lambo collection also brought into the Fisher Library Hugo De Vries' *Die Mutationstheorie*, a key text in the development of the theory of evolution by natural selection and thus of great importance in relation to the Library's very large and important Darwin collection. The Lambo collection also contains important texts of classical medicine: Amidenus Aetius' *Contractae ex veteribus medicinae* in a 1542 edition and the 1651 first edition of Apollonius Pergaeus' *Conicorum*. Its great strengths, however, are found in its 19th century holdings: an exceptional collection of the papers on radioactivity by Antoine Henri Becquerel, which led to the discovery of radium by Marie and Pierre Curie, who are also represented. There are eighteen works by Claude Bernard; presentation copies of two works by Charles Bouchard, the great 19th century French pathologist; and a first edition of Paul Broca's *Memoires d'anthropologie* (1871-77). The *Des maladies mentales* by Jean Etienne Dominique Esquirol, published in 1838, is considered the first modern textbook on psychiatry and the Lambo collection continued in this vein with runs of Sigmund Freud (including *Die Traumdeutung* of 1900), Carl Jung, and Richard von Krafft-Ebing. The first edition of René Théophile Hyacinthe Laënnec's *De l'auscultation médiate* (1819) announces the invention of the stethoscope and is a landmark work in the diagnosis of diseases of the lungs and heart. Laënnec himself died of tuberculosis the same year the second, revised, edition was published in 1826. There are several works by François Magendie and Louis Pasteur, and German editions of the works of the great Russian surgeon Nikolai Ivanovich Pirogoff. Rudolf Virchow's *Die Cellularpathologie* was published in 1858 and is the foundation work of cellular pathology. The range of the Hannah Collection was thus extended into the 20th century.

The Rucker Collection

The Rucker Collection extended the depth of the Hannah Collection in the areas of obstetrics and gynecology. Ancient writers had commented on this obvious aspect of medicine, but it was not until Eucharius Roeslin published his *De partu hominis* in 1513 that a particular interest was taken in what is essentially a book for midwives. The death of Jane Seymour in 1537 from puerperal sepsis after having given birth to Edward VI awakened an interest in the subject in England and Thomas Raynalde translated and published his *The Byrth of Mankynd* in 1540. All the early editions of these works are rare and Dr. Rucker had a 1535 edition of Roeslin and a 1552 edition of

Raynalde. He had also collected early editions of Jakob Rüff and Jacques Guillemeau. Many of the early anatomical atlases had sections on gynecology and Rucker's collection contributed to that area of the Hannah Collection as well. The status of midwives varied greatly between different European countries and there were a number of controversies concerning man-midwifery. The Rucker Collection also has Louise Boursier's *Observations diverses* (1609), the first of a number of treatises by French midwives. It was translated into English later in the century and was expanded by Thomas Mayern and the prolific Nicholas Culpeper. In North America Samuel Bard wrote his *Compendium* of midwifery in 1808. Significantly he did not mention the use of instruments, which was at the centre of the controversy about men-midwives, who in Europe and Britain were allowed to use obstetrical instruments while midwives were not. Many pamphlets were published on both sides, the cause of the men-midwives not helped by the 1726 incident when Mary Toft allegedly gave birth to a litter of rabbits, assisted by John Howard, a Godalming man-midwife. The fraud was exposed by Sir Richard Manningham in the same year. The most fatal of all diseases relating to childbirth was puerperal fever and its contagious nature was due primarily to the lack of attention by the medical profession itself and poor hygiene. This problem was directly confronted by Oliver Wendell Holmes in his 1843 work, *The Contagiousness of Puerperal Fever*. There was much opposition to Holmes' contentions and they were not finally proven until Semmelweis published *Die Aetiologie* in 1861 and even that was not fully accepted until the 1880s.

The Academy of Medicine

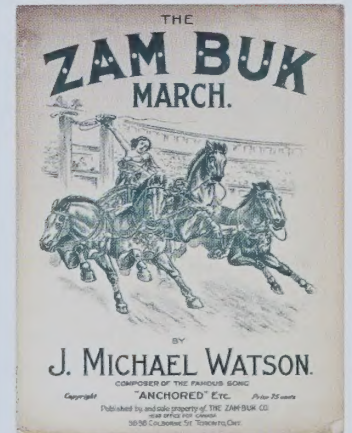
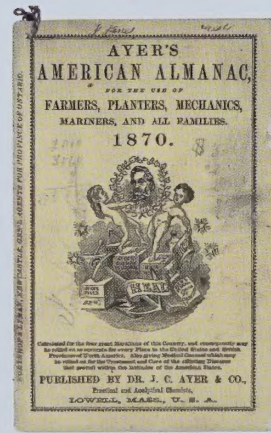
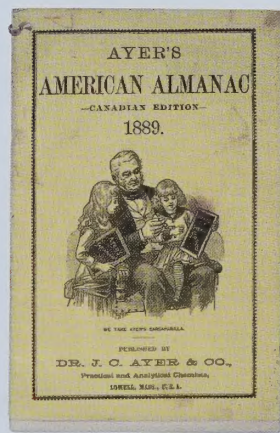
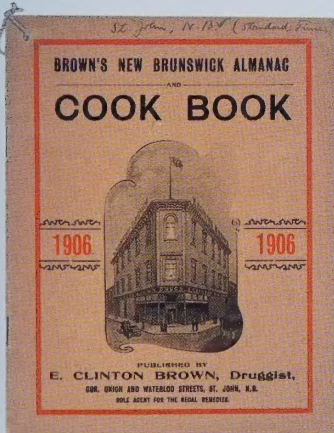
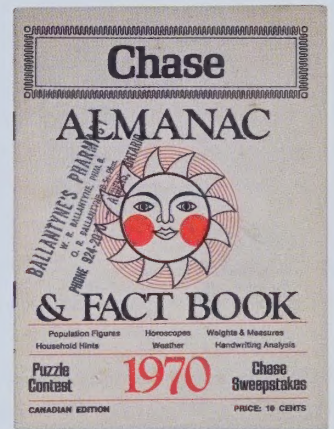
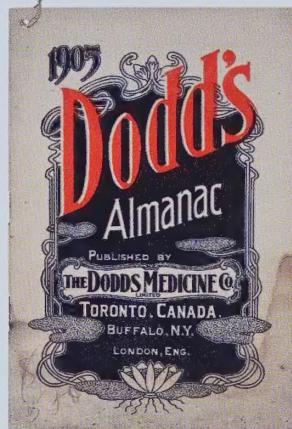
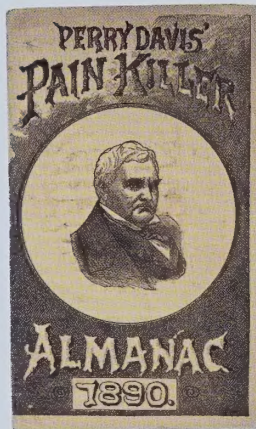
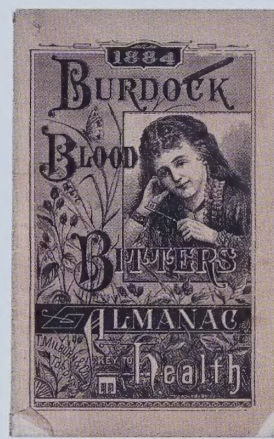
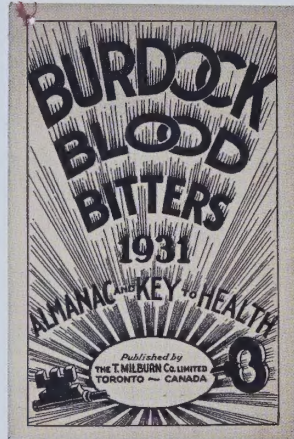
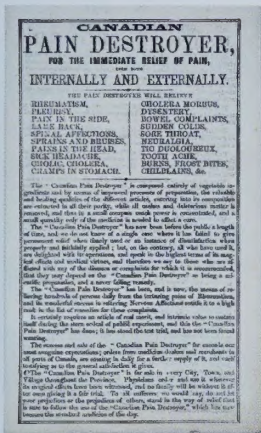
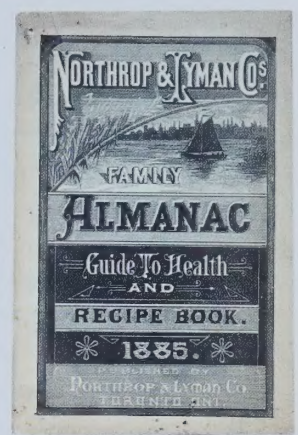
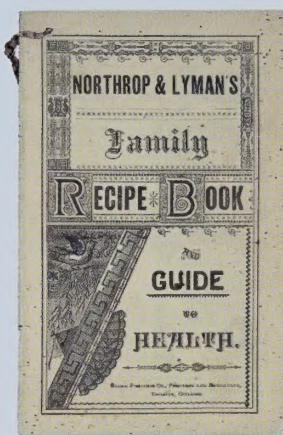
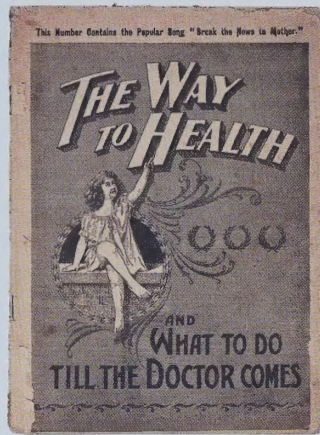
The other major collection of medical history which was finally added to the Fisher Library collections in 1991 came from the Academy of Medicine. It resides comfortably beside the Hannah Collection, with remarkably little real duplication, and is certainly appropriately located as AMS provided considerable financial support for the Academy. It was founded in 1907 with the amalgamation of the Ontario Medical Library Association, the Toronto Medical Society, the Toronto Clinical Society, and the Toronto Pathological Society. Its elected Fellows met regularly to hear lectures and participate in discussions, but it was best known to the wider medical community for its library, especially the collection of journals which were available for reference and consultation. The Academy also possessed an historical collection of rare books which by 1972 had reached over 2000 volumes and included the T.G.H. Drake Collection of pediatrics. Dr. Hannah had been a Fellow of the Academy of Medicine for many years and had initiated a series of discussions with it as a possible site for the collection, however the influence

and importance of the Academy had already begun to wane and its significance as a reference resource was assumed by the electronic data bases of the University and other providers of information. Its library and museum were dispersed and it was fortunate that the rare book collection was able to join the Hannah Collection in the Thomas Fisher Rare Book Library. The most appealing volume in the Academy collection is Edward Jenner's *An Inquiry into the Causes and Effects of the Variolae Vaccinae*, a first edition of 1798 and the basis of immunology. It was presented to the Academy by Sir William Osler in 1915.

The Development of the Hannah Collection

The enlightened generosity of Associated Medical Services since 1973 has allowed the Hannah Collection to be extended and developed in several ways. One obvious area of interest has been in the history of medicine in Canada which was not represented in the foundation collections and has presented a real challenge as most Canadian medical works of the late 18th and 19th centuries are ephemeral pamphlets and broadsides which are now very rarely offered for sale. John Mappin, a Montreal bookseller whose specialty has been Canadian ephemeral literature, offered a small collection of Canadian patent medicine almanacs and the opportunity was seized with enthusiasm. Ranging chronologically from 1861, the beginning of the genre, to the 1960s, this collection now contains over a thousand examples of almanacs either produced or distributed in Canada.

Herbal remedies have been a part of medical treatment of illness since ancient times but the marketing of patent medicines, with the familiar names such as Burdock Blood Bitters, Cherry Pectorial, and Carter's Little Liver Pills began in the United States in the mid-nineteenth century and quickly spread to Canada. The almanacs were the medium of advertising the products, but also contained the traditional elements of conventional almanacs; a calendar, weather forecasts, riddles, and stories. They were distributed annually and were especially popular in rural areas of the country where they were consulted throughout the year and then discarded when a new edition appeared. In the 1890s the Ayer Company, represented in Canada by Northrup and Lyman, distributed sixteen million copies in twenty-one languages throughout North America. The medical profession viewed patent medicine with some suspicion and it was the results of chemical analyses, which, not surprisingly, revealed a high percentage of alcohol as an essential ingredient that caused the passage of the United States Federal Food and Drug Act in 1906 and the Proprietary or Patent Medicine Act in Canada in 1908. The industry in patent



medicine, and the production of almanacs then declined, but they were still being distributed into the 1960s.

The earliest Canadian imprint in the collection is R. Stark's *Canadian Almanac and Receipt Book* of 1861, published in Woodstock, Ontario by a pharmacist who seems to have prepared the medicines himself. T. W. Georgens & Sons of Barrie produced almanacs and distributed patent medicines from 1871 and the Davis & Lawrence Co. of Montreal was also a prominent Canadian firm. The T. Milburn Company was founded in Acton in 1867, but moved to Toronto in 1873, where it apparently invented Burdock Blood Bitters, and the collection has a partial run of its almanacs from 1879 to 1931. Dodd's Medicine Company of Toronto also distributed almanacs and patent medicines all across the country from 1899 to 1961.

The research potential of the collection is, of course, much wider than its implications for medical historians. It provides valuable documentation for the history of advertising and insights into aspects of popular culture of the period. We will continue to augment the collection as opportunities arise.

We have attempted to give special attention to historical medical works that are Canadian or involve Canada and have had some success in tracking down and acquiring these often elusive works. The first mention of Canada on the title-page of an English medical treatise seems to have occurred in 1788 when François Xavier Swediaur published in Edinburgh the third edition of his *Practical Observations on Venereal Complaints*. It included *An Account of a New Venereal Disease which has lately appeared in Canada* which had been reported from St. Paul's Bay in the neighbourhood of Boucherville. Typically it was called *mal anglois* by the inhabitants of the area who believed it had been introduced by English settlers.

Dominic Blennerhasett was a medical student in Montreal in 1820/1 and from the lectures in anatomy he attended compiled a manuscript notebook. He was something of an artist and illustrated his notes with quite accomplished watercolour sketches of the various parts of the human body. His work provides a record of the teaching of medicine in Canada during an early period in which such education was uncommon.

A basic principle of developing research collections of books and manuscripts is "building on strength" and thus it was especially satisfying to augment our holdings of the works of Vesalius with the *De dissectione partium corporis humani* by Charles Etienne. Although published in 1545, two years after Vesalius' *Fabrica*, it was written, and the woodcuts prepared, in the 1530s by the son of the great scholar/printer Henri Estienne. Its importance as

an anatomical work was overshadowed by Vesalius, but it remains the finest printed medical book of the French Renaissance. Thomas Willis, one of the great medical figures of the 17th century, introduced neurology to the literature in 1664 in his *Cerebri anatome*, a study of brain dissections. His *De anima brutorum* of 1672, which compares man and animals, extends his study of neurological systems and is finely illustrated with engravings. It is a key addition to the strong collection of seventeenth-century English medicine which has also been recently enhanced by the acquisition of Peter Lowe's *A Discourse of the Whole Art of Chyrurgerie* (third edition, 1634), the first comprehensive work on surgery in Britain. It, and several other early British medical books, came from the collection of the late Dr. Edwin Clarke.

Jacopo Berengario da Carpi published the first modern work on anatomy in 1521. The *Commentaria*, as it was called, was abridged for the use of students in 1522 and again issued as *Isagogae breves* in 1523 with three additional woodcut illustrations. All these editions are rare and we were fortunate to acquire the 1523 edition recently. John of Gaddesden (ca. 1280-1348/9) wrote his *Rosa anglica* early in the 14th century. He was among the first physicians to be trained in England and the fact that the first edition of the *Rosa anglica* was published in Pavia in 1492 suggests that he had gained a European reputation. It is the first English medical work to have been printed and published.

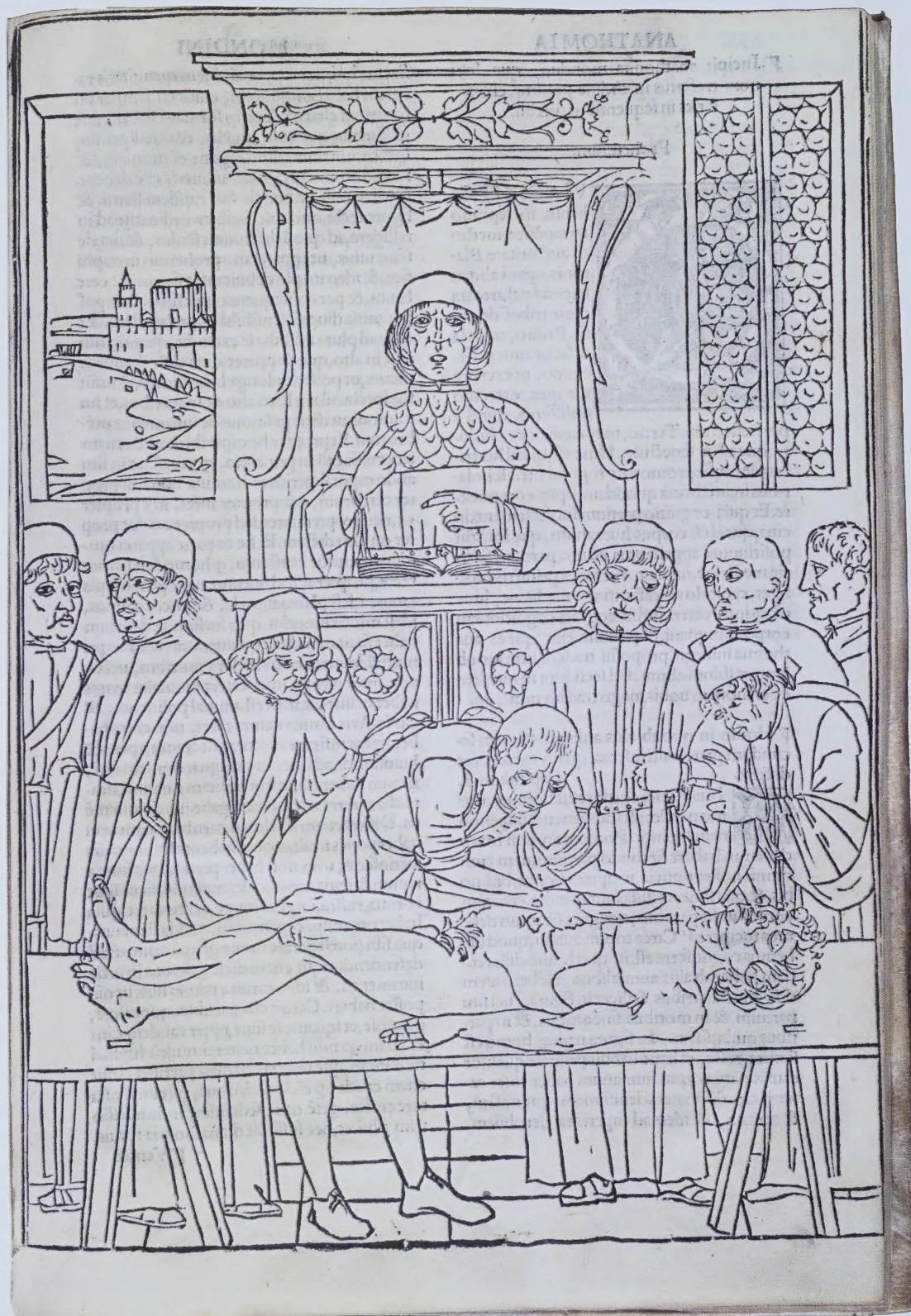
These few examples of the many books and manuscripts which have been added to the Hannah Collection are indicative of the ways in which the collection has been enhanced over the past thirty years. The search for further items will continue.

The Hannah Collection has been made known to the international research community in the field of the history of medicine through the distributed data base of the University Library system and increased access to the catalogue records has resulted in greater use. Publicity for the collection has been extended further through a University of Toronto Library digital project called *Anatomia* (URL : <http://link.library.utoronto.ca/anatomia>), which includes approximately 4500 full page plates and other significant illustrations of human anatomy, including many of the images in this catalogue. Each illustration has been fully indexed in a very detailed and sophisticated way to enable ease of retrieval, and techniques of illustration, artists, and engravers have also been identified. It has proven to be very successful, with many enquiries recorded. The other digital site we have created which deals directly with the history of medicine is *The Discovery and Early Development of Insulin* (URL: <http://link.library.utoronto.ca/insulin/>), based on the Fisher Library's collections of the papers of Sir Frederick

Banting, Dr. Charles Best, Dr. William McLeod, and Dr. Charles Collip. As research in the prevention and control of diabetes continues this site is used a great deal. Both of these websites are freely accessible to all users, and extend the specialized resources of the Library out beyond the local community.

Dr. Jason Hannah founded a great resource which continues to be used for research and teaching by a wide academic community. It will continue to reflect the motto of Associated Medical Services, "Making a Healthy Contribution".





Early anatomy: the pre-Vesalian period

The decades leading up to the publication of Vesalius' *De humanis corporis fabrica* in 1543 mark one of the most exhilarating periods in European history. The Renaissance was a time of remarkable achievement not only in science, but also in art, literature, philosophy, theology, and exploration. Influential ideas and cultural currents were rapidly disseminated, largely through the medium of print. And yet, compared with other scientific disciplines, progress in anatomical knowledge was relatively slow. A major contributing factor retarding its development was the lack of a ready supply of cadavers on which physicians could perform dissections.

Little is known about the study of anatomy in the ancient world, but it is certain that human dissection was carried out around 300 B.C. in the Greek colony of Alexandria in Egypt, where a medical school flourished for several centuries, and a great library was formed. In the second century A.D. the Greek anatomical legacy was codified by Galen (ca. 129-199), whose own writings were firmly grounded in the Alexandrine tradition. Galen, a Greek physician practising in Italy, wrote several works on anatomy. The anatomical observations they contain, however, were based on dissections performed on animals, usually pigs and apes, which were then indiscriminately applied to human anatomy.

Following the Arab conquest of Alexandria in 642, many Greek medical texts came into Arab possession, and were translated and studied. In this way the medical tradition of the ancients was preserved during the Middle Ages. Minor modifications and refinements were made, but little new was added to the canon. The main obstacle to progress of anatomical knowledge during this period was the proscription of the dissection of cadavers under Islamic law. To Muslims even the representation of the human body was strictly forbidden. In the West, the Christian church, too, was strongly opposed to dissection.

With the emergence of universities in Europe in the twelfth century, major centres for the teaching of medicine were estab-

lished at Bologna and Salerno in Italy, and at Montpellier and Paris in France by the end of the thirteenth century. Teaching was based on Arab sources deriving from the Galenic canon, and practical anatomy was based on the dissection (frequently vivisection) of animals. It was not until the fourteenth century that the civil and ecclesiastical laws constraining dissection were relaxed. In 1303 the first recorded judicial autopsy was carried out in Bologna, and by the end of the century public dissections were being officially sanctioned at Venice, Florence, and Montpellier. In 1405 Bologna was permitted to perform periodic public dissections, while Padua, destined to become the leading centre of anatomy in the sixteenth century, received legal licence for the same in 1429.



1 B

1a Joannes de Ketham. *Fasciculus medicie*. Venetiis [Venice]: Per Cesarem Arrivabonium, 1522.

1b Joannes de Ketham. *Thesoro universale della medicina ... alter volte intitolato Fasciculo di medicine*. Venetiis [Venice]: Presso Gio: Antonio Vidali, 1668

The slow progress in anatomical knowledge during the Renaissance is particularly evident in anatomical illustration. The invention of printing by Johann Gutenberg around 1450 did not result in an immediate explosion of anatomical texts with illustrations. A number of medical texts were issued in the second half of the fifteenth century, but few of them were illustrated.

The first medical text with illustrations of any significance was Joannes de Ketham's *Fasciculus medicinae* printed at Venice in 1491. Little is known of the author, who is thought to have been German. Before its publication the work had circulated widely in manuscript throughout the fifteenth century. The anatomy displayed in the six full-page wood-cut illustrations is medieval in character, and contributed little to the advancement of anatomical knowledge. The illustrations, nevertheless, do provide instructive insight into the conditions from which modern medicine arose. Each section of the *Fasciculus* has a traditional schematic diagram: urine glasses arranged in a circle; a male figure marked with the sites for bloodletting; drawings showing parts of the body governed by constellations and the zodiac. Such figures continued to appear regularly in almanacs right up to the nineteenth century.

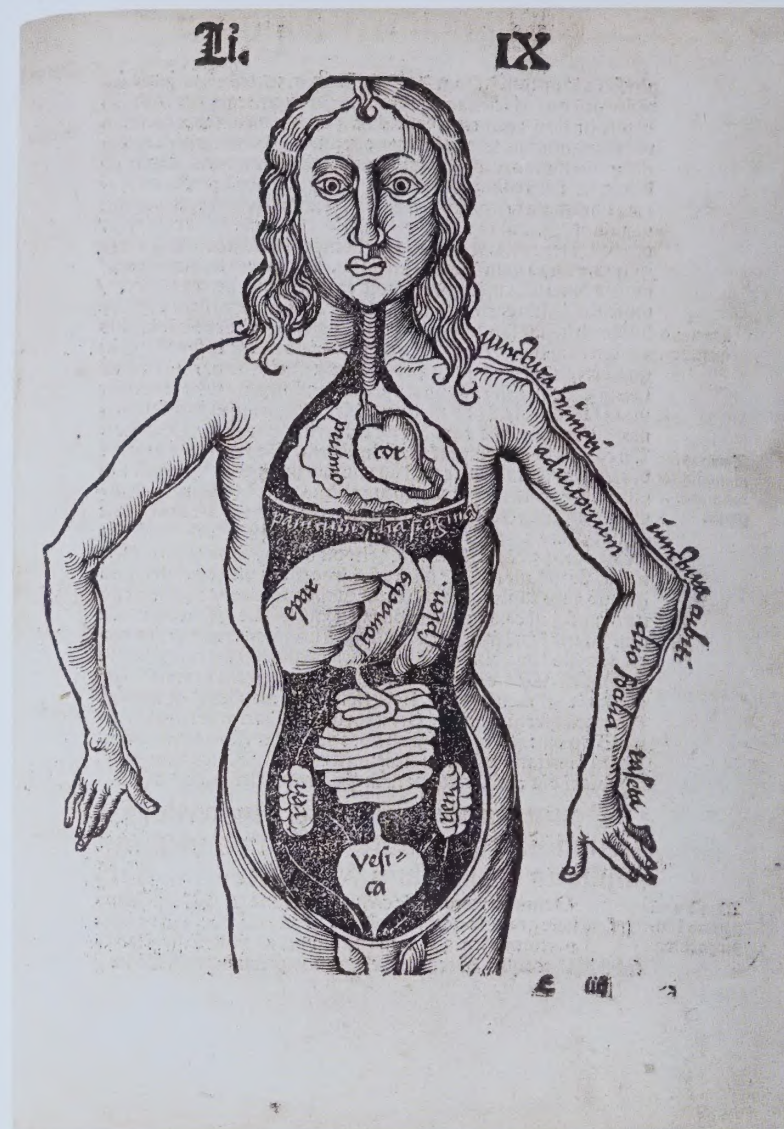
Ketham's work was re-issued in 1493 in an Italian translation. To this edition were added four full-page woodcut illustrations, attributed to artists from the school of Gentile Bellini. They represent scenes of medical practice in fifteenth-century Venice, including one of a dissection in progress. The *Fasciculus* was a popular work, being re-issued in Latin a further eight times before 1522. It was also translated into Spanish twice, and a second Italian translation appeared in 1522.

The copy displayed here is of the Latin edition of 1522 printed at Venice, which includes the plate of a dissection in progress.

Typically, anatomical figures consisted of crude schematic drawings, often based on astrological factors but certainly not on scientific observation, and were, therefore, of little value as serious teaching instruments.

2 Gregor Reisch (d. 1525). *Margarita philosophica, cū additionibus nouis, ab auctore suo studiosissima reuisione tertio supadditis*. Basileæ: Jo. Schottus, 1508.

First published at Freiburg in 1503, this work is regarded as the first encyclopædia to appear in print. It was compiled by Gregor Reisch (d. 1525), Prior of the Carthusian monastery at Freiberg, and confessor to the Emperor Maximilian I. The *Margarita* which takes its title from the Latin word for pearl, or



2

treasure, is a compendium of all the natural and moral sciences, and covers the whole university curriculum of its day. The work is divided into twelve books, each dealing with one of the established scientific disciplines: grammar, dialectics, rhetoric, arithmetic, music, geometry, astronomy, principles of natural objects (*de principiis rerum naturalium*), the origin of natural objects (*de origine rerum naturalium*), psychology, logic, and ethics.

The *Margarita* was reissued many times during the sixteenth century, even as late as 1600 in a much expanded Italian translation.

The woodcut illustration displayed here is contained in Book IX, "*De origine rerum naturalium*" and shows the rather crude representation of a male figure.



3

3 Johann Dryander (ca. 1500-1560). *Anatomiae, hoc est, Corporis humani dissectionis pars prior*. Marpurgi [Marburg]: Apud Eucharium Cervicornum, 1537.

Johann Dryander (also known as Eichmann) studied at Paris at the same time as Vesalius. In 1533 he was appointed Professor of Mathematics and Medicine at the Protestant University of Marburg, and later became Rector of the University. He was one of the first physicians in Germany to conduct public dissections, and among the first anatomists to make illustrations from their own dissections.

The first published anatomy to be devoted to a single part of the body, *Anatomiae* was the initial part of what was to be a complete illustrated anatomy. It includes twenty full-page woodcuts, signed with the monogram GVB (believed to be a member of the Basel school of woodcut designers). Sixteen of the illustrations depict a sequential dissection of the head, starting with the removal of the scalp and cranium, the exposure of the



4

meninges and cerebral hemispheres, the cerebellum, and finally the base of the skull. Eleven of the sixteen illustrations (one of which appears twice), were used by Dryander in his publication of the previous year, *Anatomia capitis humani*. They were taken from actual specimens and are realistic and precise in their detail. The remaining four illustrations are of the chest and lungs. Shown here is the *memento mori* of a skull on a pedestal, in a landscape, resting on an hourglass. The pedestal is inscribed '*Inevitabile fatum*'. The woodcut bears the artist's mark, and is dated 1536.

4 Jacopo Berengario da Carpi (ca. 1560 - ca. 1630). *Isagogæ breves*. Bononiæ [Bologna]: Impressum & noviter revissum ... per Benedictum Hectoris, 1523.

Berengario, whose family name was Barigazzi, was a native of Carpi near Modena. Once a pupil of the printer-scholar Aldus Manutius, he received his medical degree at Bologna in 1489.

He later taught surgery at Pavia and Bologna, and also practiced in Rome, where he is credited with being the first to use mercury in the treatment of syphilis. His close study of the fourteenth-century manual on dissection by Mondinus, the standard textbook of the time, resulted in *Commentaria cum amplissimis additionibus super anatomia Mundini*, published in 1521, which corrected many of the errors of Mondinus, and included many new observations by the author. The following year he issued a condensed version of his anatomical compendium, the *Isagogæ breves*, intended for use by students. The work contains many of the woodcut illustrations first used in *Commentaria*, and adds several new ones, namely of the heart and brain, including the first published illustration of the cerebral ventricles. The second edition, published in 1523, adds another three woodcuts. Berengario's illustrations represent an important stage between the anatomy of the ancients and Vesalius. They are believed to have been based on actual dissection. The full-length figures are posed and drawn against a background of nature – a style that is strikingly evident in the Vesalian woodcuts.

5 Charles Estienne [Carolus Stephanus] (ca. 1505-1562). *De dissectione partium corporis humani libri tres*. Parisiis [Paris]: Apud Simonem Colinæum, 1545.

A member of a distinguished family of printer-scholars, Charles Estienne studied medicine under Jacques Dubois (Sylvius), receiving his M.D. in 1540. Between 1544 and 1547 he was a lecturer of anatomy at the Faculty of Medicine, Paris. Abandoning medicine in 1551 he devoted himself to the family business, but was imprisoned for debt in 1561, and spent the last two years of his life in jail.

De dissectione is a good representative example of fine Parisian printing of the sixteenth century, performed by Estienne's stepfather Simon de Colines. The splendid woodcut illustrations, striking by virtue of their mannerist conceits and humorous touches, are fine works of art, several of them executed by Mercure Jollat, from drawings made by Estienne de la Rivière (Stephanus Riverius). But the anatomy they depict, firmly grounded in the Galenic tradition, makes them almost useless for purposes of anatomical instruction.

Some of the illustrations were completed as early as 1530, and the text was ready for printing in 1539. Publication, however, was delayed because of a lawsuit the author was contesting with Estienne de la Rivière, who had sought an injunction to compel Estienne to display his name on the title page as co-author. The court eventually decided in favour of the illustrator, but the

legal wrangling had held back publication. Therefore, although Estienne's text appeared after the publication of Vesalius' great work, it belongs squarely to the pre-Vesalian tradition.

While most of the plates show considerable artistry and some originality, the plates displaying the female reproductive system, all contained in book 3, are clearly copied from the series of erotic engravings executed by Giovanni Jacopo Caraglio (d. 1565) entitled "Loves of the gods". Caraglio's original shows Zeus in the guise of a satyr, seducing the sleeping Antiope, daughter of Nycteus, King of Thebes. In Estienne's version, Zeus has been removed from the scene, while the anatomized Antiope maintains her seductive pose. In several illustrations a section of the woodblock has been removed in order to accommodate an insert containing the anatomical parts under discussion.





~ Gione in Satyro ~

Che non puo far di Cytherea il figlio
 Che n mille guise mi trasforma il giorno.
 Et io ch'al suo uoler ratto in appiglio
 Spesso per forza a cotol gioco torno
 Et ogni faccia mi riueto e piglio,
 Empiendol ciel d'infamia alto et adorno.
 Et tanto me dame questi rimoue
 Che sono al piu del tempo altri che Gione.

Andreas Vesalius

6 Andreas Vesalius (1514-1564). *De humani corporis fabrica libri septem*. Basileæ: Per Ioannem Oporinem, 1543.

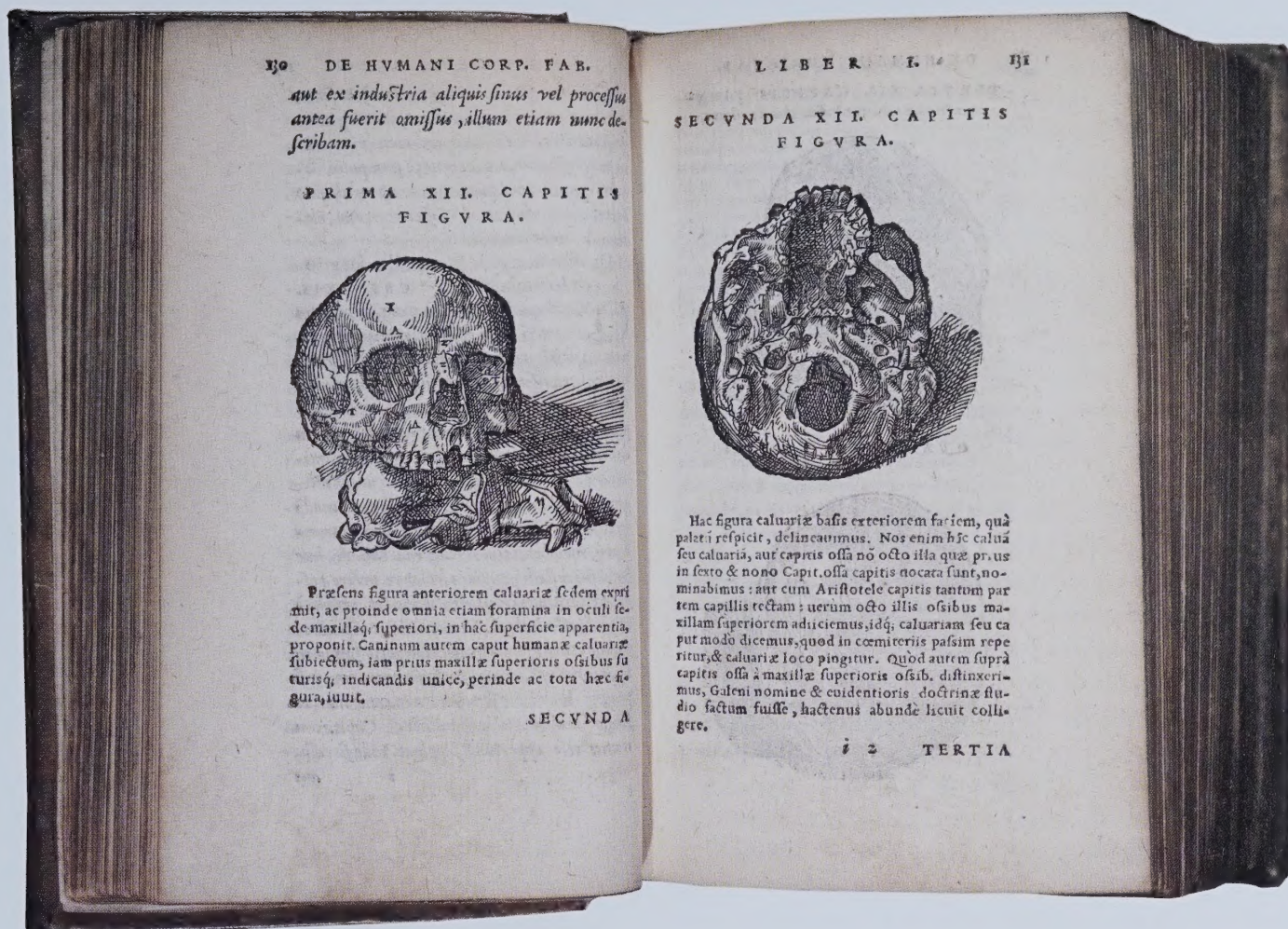
The importance of Vesalius' book cannot be understated, for not only did it provide the textual basis for a new scholarly approach to anatomy, it also heralded the beginnings of anatomical illustration based on direct observation. Vesalius was, moreover, fortunate in his choice of artist, for the woodcut illustrations that adorn his great work are notable not only for their accuracy, but also for their enormous artistic merit, which set the standard for all anatomical illustration that followed.

Vesalius in *De humani corporis fabrica* provided a complete anatomical and physiological study of every part of the human body, based on first-hand experience as public prosecutor in the Medical School at the University of Padua. His painstaking observations correct many of the errors perpetrated by Galen and his followers. *De fabrica* not only revolutionised the science of anatomy, but also its teaching. Vesalius advocated that dissection should be performed by the lecturer, as it is only through direct first-hand experience that he could learn human anatomy in sufficient detail.

De fabrica is remarkable not only for its text, but also for its magnificent woodcut illustrations. Indeed, the illustrations themselves were copied in many other medical works right up to the end of the eighteenth century. The blocks were commissioned by Vesalius, who supervised their production. They are thought to have been executed in Venice by an artist from the studio of Titian, most probably Jan van Calcar, who, like Vesalius, was a native of the Low Countries. The finished blocks were dispatched to Basel, where they were used by the printer-scholar Johannes Oporinus, to produce two editions of *De fabrica*.

The 200-plus anatomical illustrations fall into three categories: the skeleton men, of which there are three; the muscle men,





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fourteen in number; and the individual parts of the body. The most striking are the flayed muscle men, arranged to display a progressive dissection, from the superficial muscles to the deep layers.

The illustrated title page to the work is also fascinating. The turbulent scene of a public dissection is full of symbolism, and has been the subject of much commentary. In the centre of the scene is Vesalius himself, breaking with custom by descending from the lecturer's podium to conduct the surgical demonstration in person, in contrast with the lecturer in the Ketham illustration, who speaks *ex cathedra*, leaving the dissection itself to menials.

In addition to the anatomical illustrations, *De fabrica* is adorned by twenty-one pictorial woodcut initials, depicting putti or cherubs engaged in various acts associated with dissection, such as removing a corpse from the gallows, preparing skeletons for study, dissecting a pig, etc. These initials add an element of macabre humour to the work.

De fabrica was immediately recognized as a landmark in medical practice. It was reissued, translated, copied and plagiarized many times. A second authorized edition, containing Vesalius' revisions, was issued by Oporinus in 1555.

Vesalius also published an abbreviated version, an "epitome", which was reissued and translated several times. Further editions of *De fabrica* were published in Venice in 1568 and 1604.

7 Andreas Vesalius. *De humani corporis fabrica, lib. VII.* Lugduni [Lyon]: Apud Ioan. Tornæsium, 1552. 2 vols.

Medical books were frequently printed in small formats in the sixteenth and seventeenth centuries. This edition of Vesalius, chronologically the second, was in fact unauthorized. It was issued in Lyon which became a centre for pirated editions of popular works in the sixteenth century, and no doubt the prestige of Vesalius' work in the medical book trade tempted the

scholar-printer Jean de Tournes to capitalize on its success with a pocket-sized edition aimed at the student market. However, since the principal virtue of Vesalius' book lay in the illustrations, their reproduction in such a small (sixteenmo) format would have rendered them practically useless. For this reason the woodcuts, with the exception of four minor ones of the cranium, were omitted from de Tournes' publication. The second authorized and fully illustrated edition was published in folio at Basel in 1555.

8 Andreas Vesalius. *Opera omnia anatomica & chirurgica*. Lugduni Batavorum [Leiden]: Apud Joannem du Vivie, et Joan. & Herm. Verbeek, 1725.

This first collected edition of Vesalius was prepared for publication by two of the leading lights of medicine at the University of Leiden – Hermann Boerhaave and Bernhard Siegfried Albinus. Boerhaave in particular was an enormously influential teacher, who attempted to reconcile modern medical discoveries with those of previous centuries. The result was a series of classical medical texts, of which this edition of Vesalius was one. The edition was sumptuously printed and supplied with a new set of plates engraved by Jan Wandelaar (1690-1759) who was also responsible for the engraving of the plates for Albinus' anatomical atlases, one of which is featured in this exhibition. It is fitting testimony to Vesalius' original illustrations that almost two hundred years after the publication of *De fabrica* they were still highly regarded for their scientific validity, and that their rendering through the medium of engraving on copper retained the great artistry of the woodcut originals.

9 Andreas Vesalius. *Icones anatomicae*. Monachis [Munich]: Ex officina Bremensi, 1934.

The survival of the woodblocks used in the printing of the Basel editions of *De fabrica* is one of the most remarkable episodes in the history of this extraordinary book. In 1583 the Swiss physician Felix Platter had reported that the Vesalian woodblocks were being offered for sale in Basel. At the beginning of the eighteenth century they emerged in Augsburg and were used by Andreas Maschenbauer to illustrate an abridged edition of Vesalius published in 1704 and again in 1723. In 1770 the blocks were taken to Ingolstadt where they were employed to illustrate a work by Heinrich Palmaz Leveling in 1783. At the beginning of the nineteenth century the contents of the University of Ingolstadt library were transferred to Landshut, and in 1826 finally to Munich. For almost seventy years the blocks were forgotten and were essentially lost to the world. In 1893 some blocks were discovered at the University of Munich



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Library. The remainder were found in 1932. Some blocks, including the pictorial woodcut initials, however, never surfaced.

In a joint venture between the University of Munich and the New York Academy of Medicine, an edition of Vesalius' *Icones anatomicae* was produced by the Bremer Presse from the original blocks. The story does not end there, however. Sadly the blocks were obliterated during the bombing of Munich during the Second World War.

10 George Stanley Terence Cavanagh. *The Panorama of Vesalius: a 'Lost' Design from Titian's Studio*. Athens, Ga.: Sacrum Press, 1996.

The use of background landscape to provide a sense of reality and perspective to anatomical figures was fairly conventional by the time of the publication of *De fabrica*. (cf. Dryander and



11

Berengario da Carpi). The backgrounds to the fourteen Vesalian muscle men woodcuts, drawn with the same clarity and devotion to detail as those of the anatomical subjects themselves, form two continuous landscapes. Surprisingly, it was not until 1964 that this connectivity as reversed segments of panoramic friezes was first recognised.

Several unsuccessful attempts have been made to identify specific features of the landscape. It is agreed, however, that the topography is very much in character with the Eugenic hills as seen from the river journey between Padua and Venice during the sixteenth century.

The friezes displayed here were created from photo-etched magnesium plates photographed from the 1543 edition of *De fabrica*. Each of the fourteen negatives was reversed in the enlarger, and then joined together in the correct sequence (the first and second figures were transposed). The frontal views form one panorama, the back views another.

11 Juan de Valverde [de Amusco] (ca. 1525 - ca. 1588). *Anatomia del corpo humano*. In Roma: Per Ant. Salamanca, et Antonio Lafreri, 1560.

The anatomical textbook of the Spaniard, Juan de Valverde de Amusco, who studied under Vesalius at the University of Padua, first appeared in Spanish at Rome in 1556. Its great popularity ensured numerous translations into Latin, Italian, and Dutch. Of the forty-six plates contained in Valverde's work, thirty-eight were taken directly from Vesalius, whom Valverde acknowledged with high praise in the preface. In distinction to the woodcuts of Vesalius, Valverde's plates were engraved on copper, probably by Gaspar Becerra, who had worked with Michelangelo on the Sistine Chapel. Although Valverde's text relied heavily on Vesalius', he makes about sixty corrections and additions to his former teacher's work, mostly in the captions to the illustrations. The remaining eight plates that were not copied from Vesalius, are Valverde's original work, and are striking by virtue of their mannerist excesses, such as the plate shown here, of an *ecorché* (flayed) figure in a landscape holding his skin in one hand, a skinning knife in the other.

12 Thomas Geminus (ca. 1510-1562). *Compendiosa totius anatomie delineatio*. London: Imprinted by Thomas Gemini, 1559.

An abridgement of Vesalius' *De fabrica*, the *Compendiosa* was important for introducing Vesalian anatomy into England. The original Vesalian woodcut illustrations were redrawn and engraved in copper. The backgrounds were modified, and a few figures appear in reverse. Geminus was unjustly accused of plagiarising Vesalius (the first of several plagiarisms); but in fact Geminus acknowledged his debt to Vesalius in the introduction to the first edition, published in Latin in London in 1545. However, Vesalius' name is absent from the English translations that appeared in 1553 and 1559.

Geminus (also known as Lambricit or Lambert), is believed to have emigrated from the Low Countries to England about 1540. He established himself as a successful instrument maker and engraver, and introduced into England the use of copper engraving for book illustration. The first work to contain engravings produced by Geminus, was the 1545 revision of Thomas Raynalde's *The byrth of mankynd*, which had two small plates copied from Vesalius. Geminus's own *Compendiosa*, with its forty illustrations was the second English book to be illustrated with copper plates, and the first to have an engraved title page.



12

The first edition of the *Compendiosa*, published in 1545, was dedicated to Henry VIII to whom Geminus, despite his lack of formal medical training, was physician. In 1555 the College of Physicians of London put a stop to his illegal practice of medicine and surgery. The plates are accompanied by the text of Vesalius' *Epitome*, and the Latin text of Vesalius' descriptions of the illustrations from *De fabrica*. The English translation, undertaken by Nicholas Udall the dramatist and translator of Erasmus, substituted Vesalius' Latin text with an English "treatyse", based on Thomas Vicary's *Anatomie of the Bodie of Man* (1548), together with fragments from other works. The English translation was intended for the benefit of the barber-surgeons, most of whom knew no Latin. The first English translation was dedicated to Edward VI, while the second English version was dedicated to Queen Elizabeth, and is notable for the engraved portrait, believed to be the earliest depiction of the newly crowned queen.

Post-Vesalian anatomy

13 Bartolomeo Eustachi (d. 1574). *Explicatio tabularum anatomicarum Bartholomæi Eustachi* [ed. B.S. Albinus]. Leidæ Batavorum: Apud Joannem Arnoldum Langerak, et Joannem & Hermannum Verbeek, 1744.

Eustachi first studied and then taught anatomy at the medical faculty in Rome. He is considered to be the most scientific anatomist of the Renaissance. Although well known for his published writings during his lifetime, he is remembered principally for the series of anatomical plates of skeletons and muscle men published a hundred and forty years after his death. The plates, drawn by Pier Matteo Pini, and engraved by Giulio de' Musi under Eustachi's supervision, were completed by 1552. However, only eight of the forty-seven plates were published during Eustachi's lifetime. On his death the plates remained with his family. They were eventually acquired by the Vatican library, and through the efforts of the papal physician, Giovanni Maria Lancisi, were published at Rome in 1714. As Eustachi's text to the plates was either never completed or was lost, commentary was provided by Lancisi and later editors. Some editions of the eighteenth century were printed from the original copper plates, others from re-engravings, notably the Roman edition of 1728, and the Leiden edition of 1744, edited by Bernard Siegfried Albinus.

Eustachi was critical of Vesalius' illustrations. Whereas Vesalius had chosen woodcuts with their strong contrasts, Eustachi preferred copper engraving which provided a more delicate delineation of detail. In contrast to the Vesalian illustrations Eustachi's elegant figures are less dramatic, and have no landscape backgrounds. His plates are remarkable for the anatomical knowledge they contain, accumulated from the study of many cadavers. They begin with the abdominal structure, then the thorax, the nervous system, the vascular system, the muscles, and finally the bones. Each plate has a graduated border which provides grid references to connect text with illustration. The illustrations, therefore, are clearer, unencumbered by superim-



13

posed lettering or numbering. The plates in Albinus's edition of 1744 are accompanied by outline figures on which reference letters and numbers are placed. The example on display shows the muscles and subcutaneous nerves of the body in a superficial dissection, alongside its companion outline plate.

14 Fabricius ab Aquapendente (ca. 1533-1619). *Tractatus quatuor; quorum I. De formatu foetu. II. De locutione & eius instrumentis. III. De loquela brutorum. IV. De venarum ostiolis.* Francofurti [Frankfurt]: Impensis Iacobi de Zetter, typis Hartm. Palthenij, 1624.

Girolamo Fabrici, better known under the Latinized form of his name, Fabricius ab Aquapendente (from the name of his home town, near Orvieto in Italy), studied medicine under Gabriele

Fallopippo at Padua, and eventually succeeded him as Professor of Anatomy in 1562, a position he held for more than fifty years, retiring in 1613. An outstanding teacher, he counted Harvey, Bauhin, Paaw, Spieghel, Casserio, and Caspar Bartholin among his pupils, and was responsible for the construction of the anatomical theatre at Padua in 1594. In addition he taught privately, and was a practicing physician and surgeon, Galileo and Paolo Sarpi being among his patients.

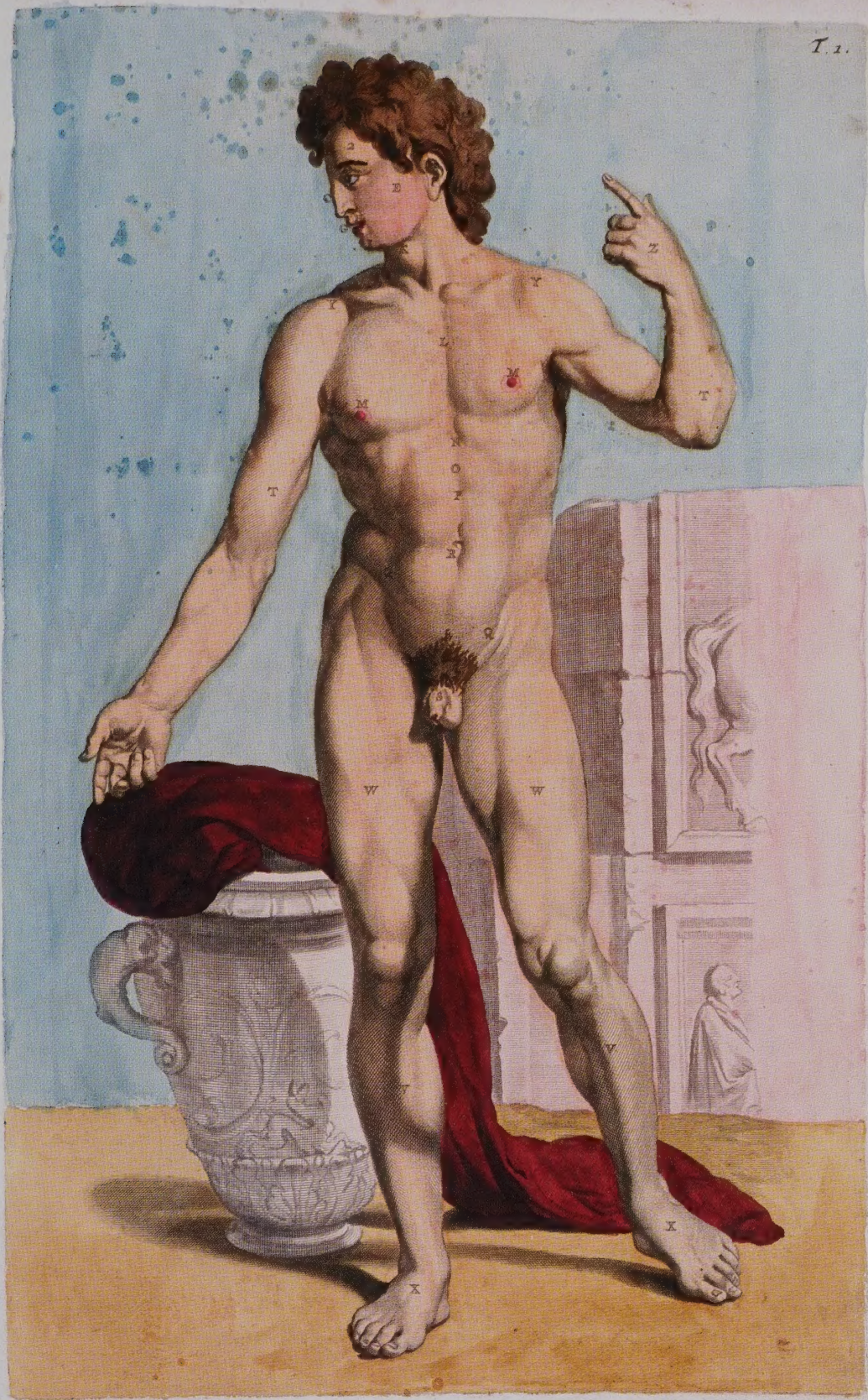
Fabricius laboured many years over a projected textbook of anatomy, to be entitled *Totius animalis fabricae theatrum*, which would reflect the advances made since Vesalius, Eustachi and others. The project as a whole, however, was only partially realized. It was not until 1603, when he was in his mid-sixties, that the first part appeared – *De locutione et eius instrumentis liber*. Other monographs followed, notably: *De venarum osteolis* (1603); *De formatu foetu* (1604); and, posthumously, *De formatione ovi* (1621).

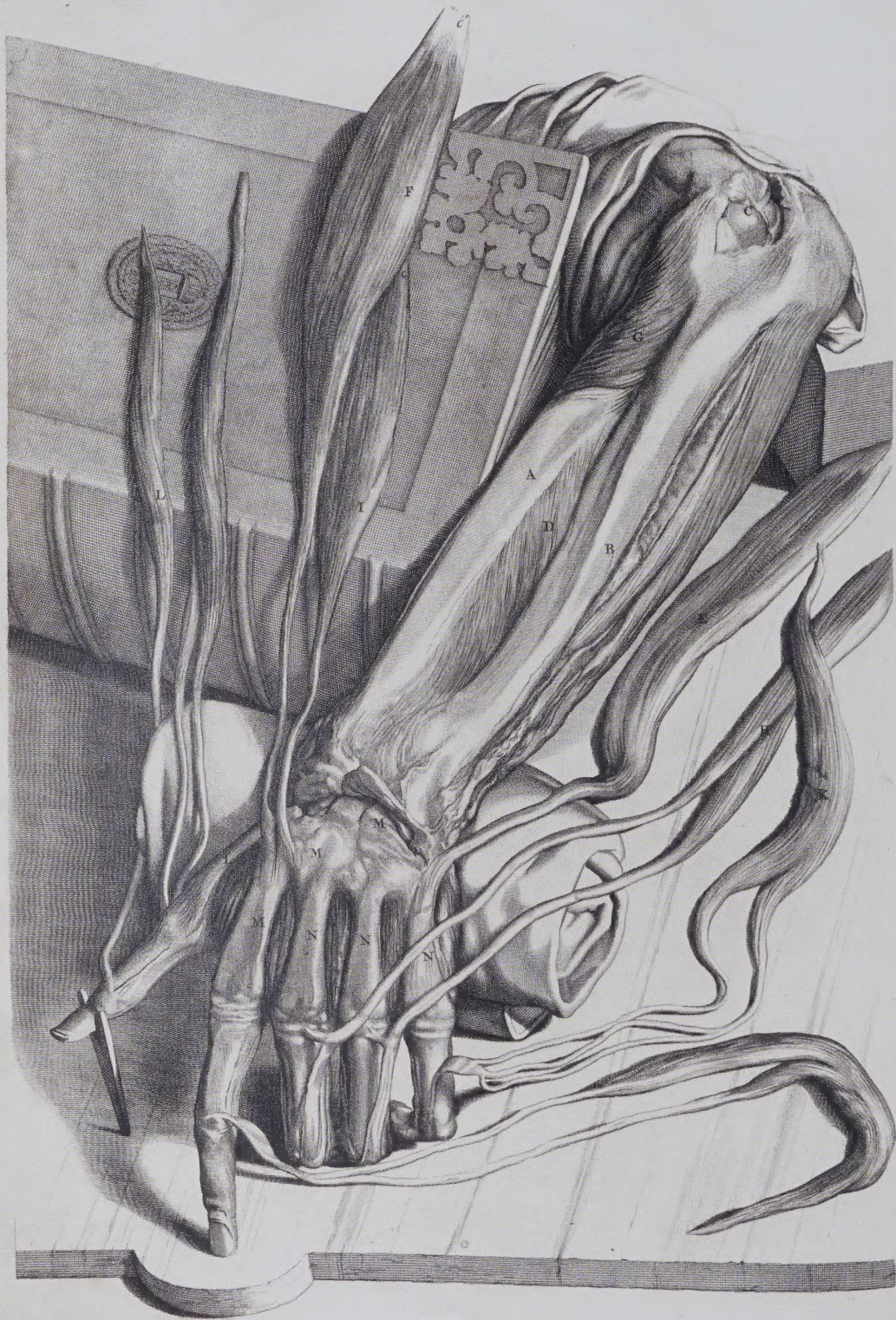
De venarum osteolis, first published at Padua in 1603, was Fabricius' most important work. Although the presence of valves in the veins had been known since at least the mid-sixteenth century, Fabricius was the first to give a systematic and accurate description of them. He discusses the role of the valves in slowing down the normal flow of blood in order to maintain an even distribution of the blood to the various parts of the body. The work had a great influence on Harvey in his landmark discovery of the circulation of the blood. Fabricius' work is illustrated with twenty-three plates. The one displayed here, showing the veins at the inner surface of the forearm, was adapted by Harvey in reduced size in *De motu cordis* (1628). Other of Fabricius' plates were widely borrowed and frequently reproduced in anatomical textbooks.



14







15 Govert Bidloo (1649-1713). *Anatomia humani corporis*. Amstelodami [Amsterdam]: Sumptibus viduæ Joannis à Someren, hæredum Joannis à Dyk, Henrici & viduæ Theodori Boom, 1685.

Bidloo attended Frederik Ruysch's anatomical lectures at the Surgeons' Guild in Amsterdam, before qualifying as a surgeon at the University of Franeker in 1682. Following the success of his anatomical atlas, he became Professor of Anatomy and Surgery at the Hague in 1688, succeeding Anton Nuck. In 1690 he was appointed by William of Orange to General Superintendent of all physicians, apothecaries and surgeons, and also of all civic and military hospitals in the Netherlands. In 1694 he again succeeded Nuck, this time as Professor of Anatomy and Surgery at Leiden. He was also appointed physician in ordinary to the sickly William III, accompanying him to England, and attending him during his final illness in 1702. After the king's death he returned to his teaching at Leiden, which had been neglected for several years. Albinus was one of his students. Bidloo was also a minor poet and playwright

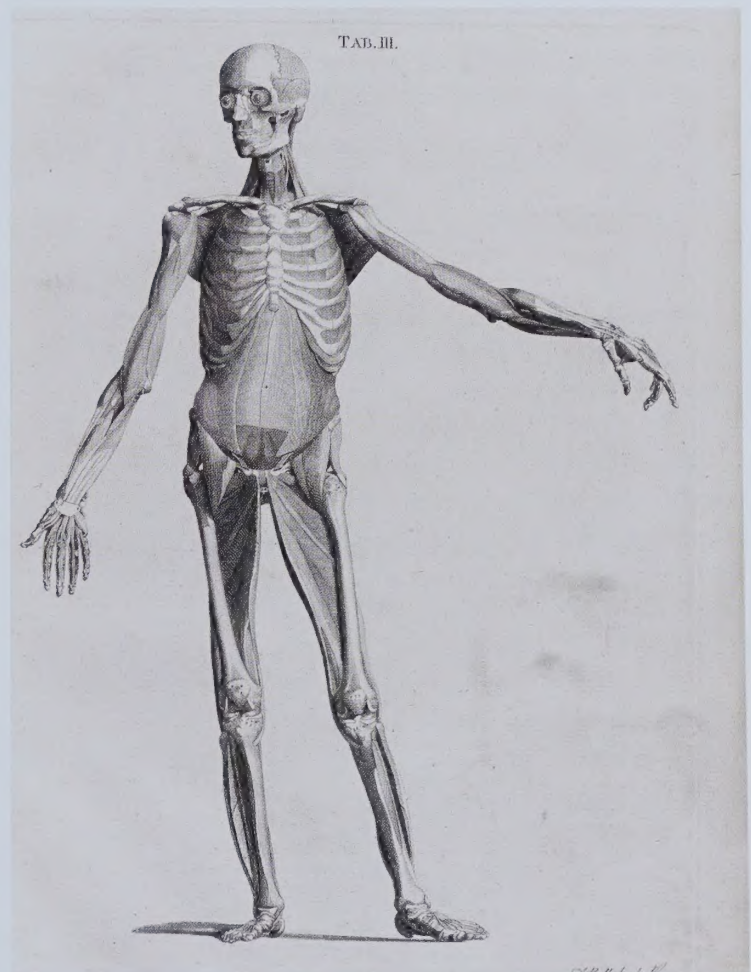
Bidloo's *Anatomia humani corporis* is one of the finest anatomical atlases ever printed, as well as one of the largest, measuring 61 x 36 cm. and weighing 5 kilos. The 105 plates were drawn by Gérard de Lairese (1641-1711), and were engraved possibly by Abraham Bloteling, inventor of the rocker tool used in mezzotint, and the engraver of Bidloo's portrait at the front of the atlas. Others claim that Pieter and Philip van Gunst engraved the plates, which introduce Dutch still-life painting into anatomical illustration. Figures are depicted almost tenderly, with such homely touches as nightclothes, bedding, or ordinary household objects, such as jars, books, kitchen knives, etc. Raw dissected parts contrast with soft uncut flesh. Naturalistic detail include a live fly on an open abdomen. Eighty-three of the plates depict the body in various stages of dissection, some providing details of the instruments used. One of the most remarkable illustrations is plate 71 which shows the bones, muscles and tendons of the forearm and hand. The dissected member seems to emerge from the book, and appears alive with its index finger in a pointing gesture.

The plates are accompanied by a brief Latin text, too lacking in detail to be instructive. A Dutch translation was published in 1690. Although the atlas established Bidloo's name, his anatomical preparations were not always accurate. Lairese, moreover, often provided what was lacking, sometimes even altering the position of organs and muscles. Despite the anatomical shortcomings of the illustrations, which were criticised by Ruysch and others, the artistic value of the atlas is beyond dispute.

Bidloo was a difficult personality and made many enemies. Ruysch's justified criticism of his atlas led to an acrimonious polemic that became personal. Bidloo also spent time in jail for publishing a pamphlet criticising the judges of Holland, and was released only after the intervention of William III. Following the monarch's death, Bidloo wrote a pamphlet in which he attacked the other physicians attending the king. His most famous polemic, however, was with William Cowper, who published the plates from Bidloo's atlas, with a new text.

16 Bernhard Siegfried Albinus (1697-1770). *Tables of the Skeleton and Muscles of the Human Body*. Edinburgh: Printed by Balfour & Smellie, for Andrew Bell, engraver, 1777-1778.

Albinus entered the University of Leiden at the age of twelve, and spent nine years studying under his father, Boerhaave, Bidloo, and Rau. He received his M.D. in 1719, and two years later, on the death of his father, was appointed at the age of twenty-four to the chair of anatomy and surgery, a position he held for the next fifty years. Such was his reputation, that his lectures attracted students from all over Europe and the American colonies. As well as his own writings, he edited the works of earlier medical writers, notably Vesalius (with



Boerhaave), Fabricius ab Aquapendente, Harvey, and Eustachi. To his 1744 edition of Eustachi, Albinus supplied a new medical commentary. Each of these works was adorned with plates newly engraved by Jan Wandelaar (1690-1759) under Albinus' direction. Wandelaar also engraved the plates for Albinus's own works.

Albinus devoted many years to devising new methods of draughtsmanship for his anatomical illustrations, which he recorded with painstaking care and accuracy. He describes his methods in the preface to his *Tables of the Skeleton*. He compared his method to that of an architect, who lay the foundation on which he then built; in similar fashion, Albinus began with the skeleton, making important contributions to osteological study.

Albinus's greatest work was his *Tabulae sceleti et musculorum corporis humani*, begun in 1725 and first published at Leiden in 1747. The *Tabulae* consists of three skeletal plates (front, side and back views), nine plates of the muscles (front, side and back views, at various stages of dissection), all with accompanying outline plans. There are a further sixteen plates, without outlines, illustrating the separated muscles individually portrayed. The skeletal and muscle plates have exotic backgrounds - wooded pools, pastoral landscapes, a rhinoceros, justified by Albinus as arousing interest, filling empty space, and providing a three-dimensional effect. They were probably intended for artists as much as anatomists. The plates in this English translation, published at Edinburgh in 1777-1778, were re-engraved by Andrew Bell and omit the backgrounds, resulting in flatter looking subjects, as for example this anterior view of a male figure.

17 Paolo Mascagni (1755-1815). *Vasorum lymphaticorum corporis humani historia et ichnographia*. Senis [Sienna]: Ex typographia Pazzini Carli, 1787.

The years 1770-1790 marked intensive research into the lymphatic system, in England by William Hewson, William Cruikshank, and John Sheldon; in Germany by Johann Gottlieb Walter, and Samuel Thomas von Soemmerring; in France by Raphael Bienvenu Sabatier; and in Italy by Antonio Scarpa and Paolo Mascagni.

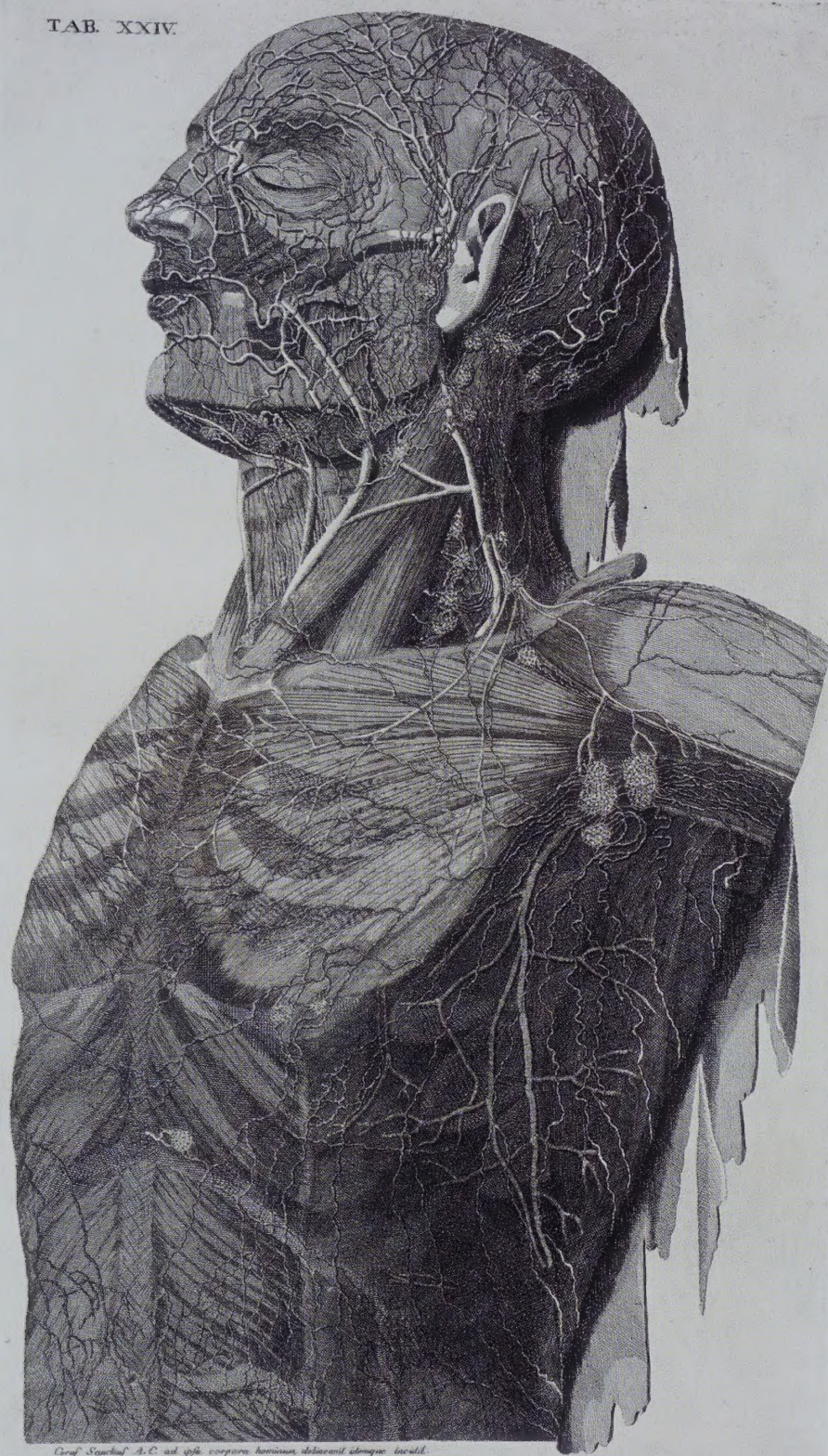
Mascagni attended the University of Siena, becoming assistant to Pietro Tabarini, whom he succeeded in 1779 as Professor of Anatomy. He also held a post at Pisa before moving to Florence where he taught a variety of subjects, including art anatomy. His major contribution to the subject was contained in his *Vasorum lymphaticorum*.

Mascagni paved the way for advances in anatomy, physiology and clinical medicine. The mercury injection method enabled him to observe, name and describe almost all the lymph glands and vessels in the human body. Indeed, he discovered about half of the lymphatic vessels now known.

At the time of his death in 1815 Mascagni was working on a huge scheme of a universal anatomy, using life-size colour illustrations, of the entire human body, aided by the best Siennese and Florentine artists of the day. Part of the scheme was realised with the posthumous publication of *Anatomia universa* between 1823 and 1832. Printed by Firmin Didot, it is claimed to be the most splendid anatomical atlas ever produced. The forty-four huge plates, measuring 95 x 68 cm. took the engraver Serantoni nine years to produce.

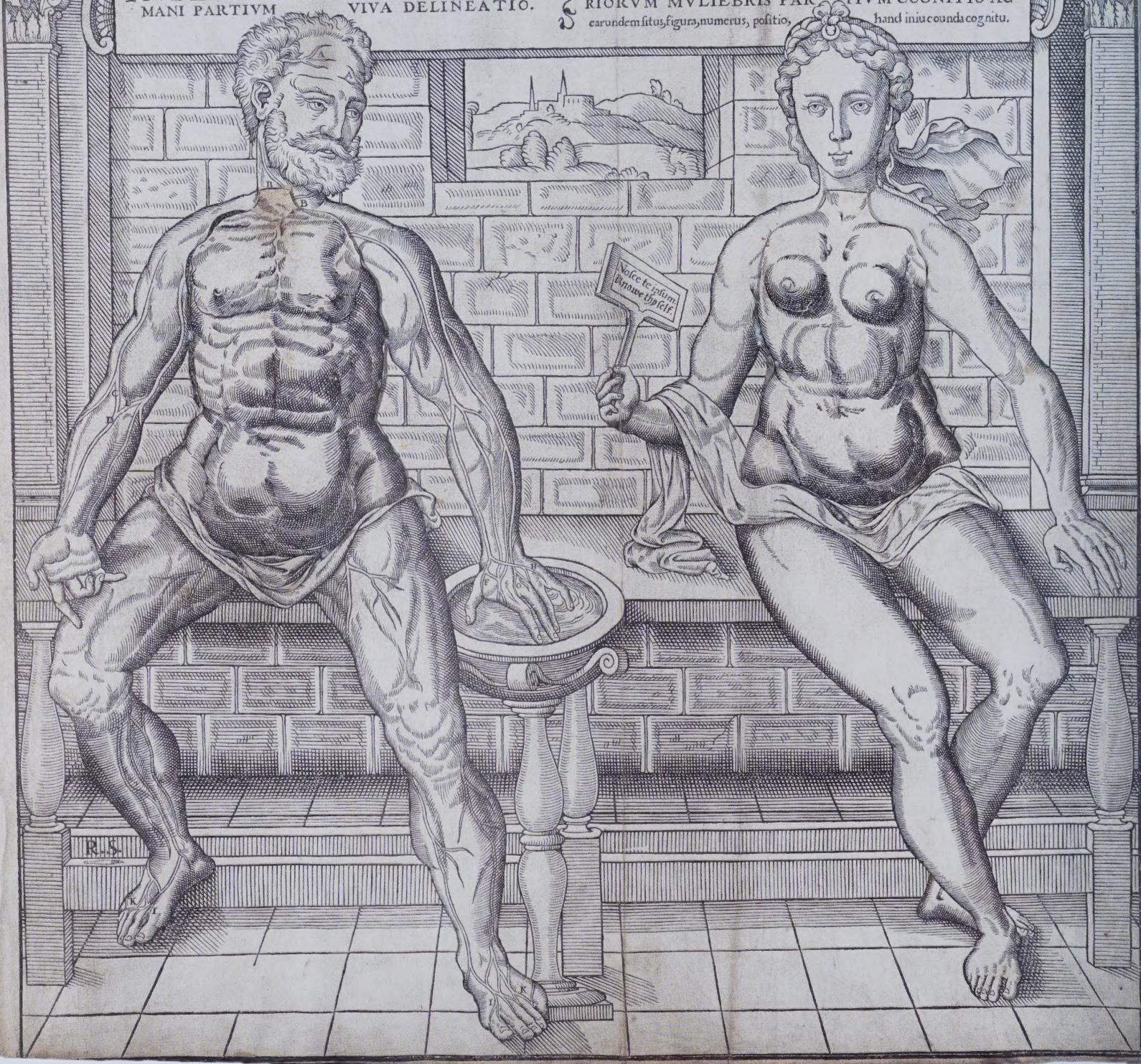
Vasorum lymphaticorum contains twenty-seven plates and fourteen outline keys of the human lymphatic system, drawn and engraved by Ciro Santi of Bologna. Plate 24 shows a superficial dissection of the head and face, together with a deep dissection of the neck and axilla, revealing the lymphatic venules of the head, neck and thorax, together with the supraclavicular and axillary nodes.

TAB. XXIV.



Gray Sculp. A.C. ad vñ. corpora hominum delatant utique facit.

INTERIORVM CORPORIS HVIRI PERVTILIS ANATOMES INTERIORVM MVLIEBRIS PARTIVM COGNITIO AC
 MANI PARTIVM VIVA DELINEATIO. earundem situs, figura, numerus, positio. hand inuicem cognitu.



Flap books

18 *Interiorum corporis humani partium viva delineatio.*
[London, ca. 1559].

The technique of demonstrating anatomy by multi-layered flaps became a popular means of illustration during the sixteenth and seventeenth centuries with “Adam and Eve” plates or “fugitive leaves” as they were sometimes known. This particular copy of *Interiorum corporis humani partium viva delineatio* was inserted in the copy of the 1559 edition of Thomas Geminus’ *Compendiosa totius anatomie delineatio*, where it is commonly found. It has been suggested that these plates were used by physicians, surgeons, barbers, apothecaries, etc. for didactic purposes. However, the fact that the anatomy is pre-Vesalian, and that so many of them were produced, suggest that they were intended for laymen who wanted to acquire a rudimentary knowledge about the human body. This type of illustration, moreover, invited readers to replicate, as it were, the work of the dissector in exposing the underlying layers of the body.

19 Johann Remmelin (d. 1583). *Catoptrum microcosmicum.*
Ulmæ Suevorum [Ulm]: Sumptibus Iohannis Görlin; imprimebat Balthasar Kühne, 1639.

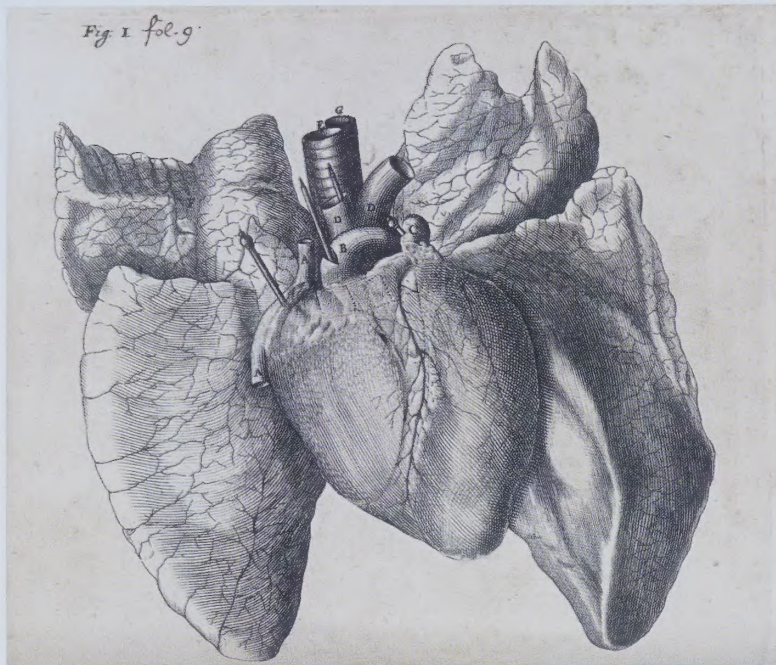
Remmelin’s *Catoptrum microcosmicum*, first published in 1613, was the first anatomical atlas to be illustrated with flaps. It contains three full-page plates, engraved by Lucas Kilian (1579-1637) after Remmelin’s drawings, and includes an accompanying text. The title page is typically full of allegorical figures and various medical instruments. There are individual plates of the male and female bodies, and a third plate consisting of a male and a female body together with the trunk of a pregnant female. Each plate is composed of compound flaps with up to nine sub-flaps, some with double-sided images or a combination of image and text.

In the plate of the female, Eve rests her foot on a skull from which crawls the serpent clutching in its mouth a twig from the Tree of Knowledge, signifying the contemporary misogynistic view of Eve’s role in the fall of humankind. The phoenix, whose smoke obscures Eve’s genital region, symbolizes regeneration and rebirth. Salvation is specifically symbolized in the Adam plate through the figure of Christ crucified.

Catoptrum microcosmicum went through several editions in Latin, German, French, Dutch and English. The last edition was published in Verona in 1754. Although produced in great numbers, few have survived in good condition. This Ulm edition of 1639 was a re-issue of the 1619 edition with a cancel title page.



19
20 René Descartes (1596-1650). *De homine: figuris et*



20

Latinitate donatus a Florentio Schuyt. Lugduni Batavorum [Leiden] : Apud Franciscum Moyardum & Petrum Leffen, 1662.

Remembered principally for his philosophical writings, Descartes also made valuable contributions to medical science. *De homine* was intended as a physiological appendix to his famous philosophical work, *Discours sur la methode* (1637), but with the Catholic Church's condemnation of Galileo still fresh in his mind, Descartes decided to suppress the work out of fear of being charged with heresy. It was first issued in 1662, twelve years after his death, in a Latin translation undertaken by Florentius Schuyt; the French original was issued two years later.

Regarded as the first European book on physiology, *De homine* explained all physical motion in purely mechanical terms. The work was based on Descartes' notion of man as a machine created by God, and directed by a rational soul located in the pineal gland. It is the first work to refer to involuntary reflex action. Shown here is a fine engraving of the anatomy of the heart and lungs, with layered flaps over the heart revealing the underlying layers of right and left ventricles.

Surgery

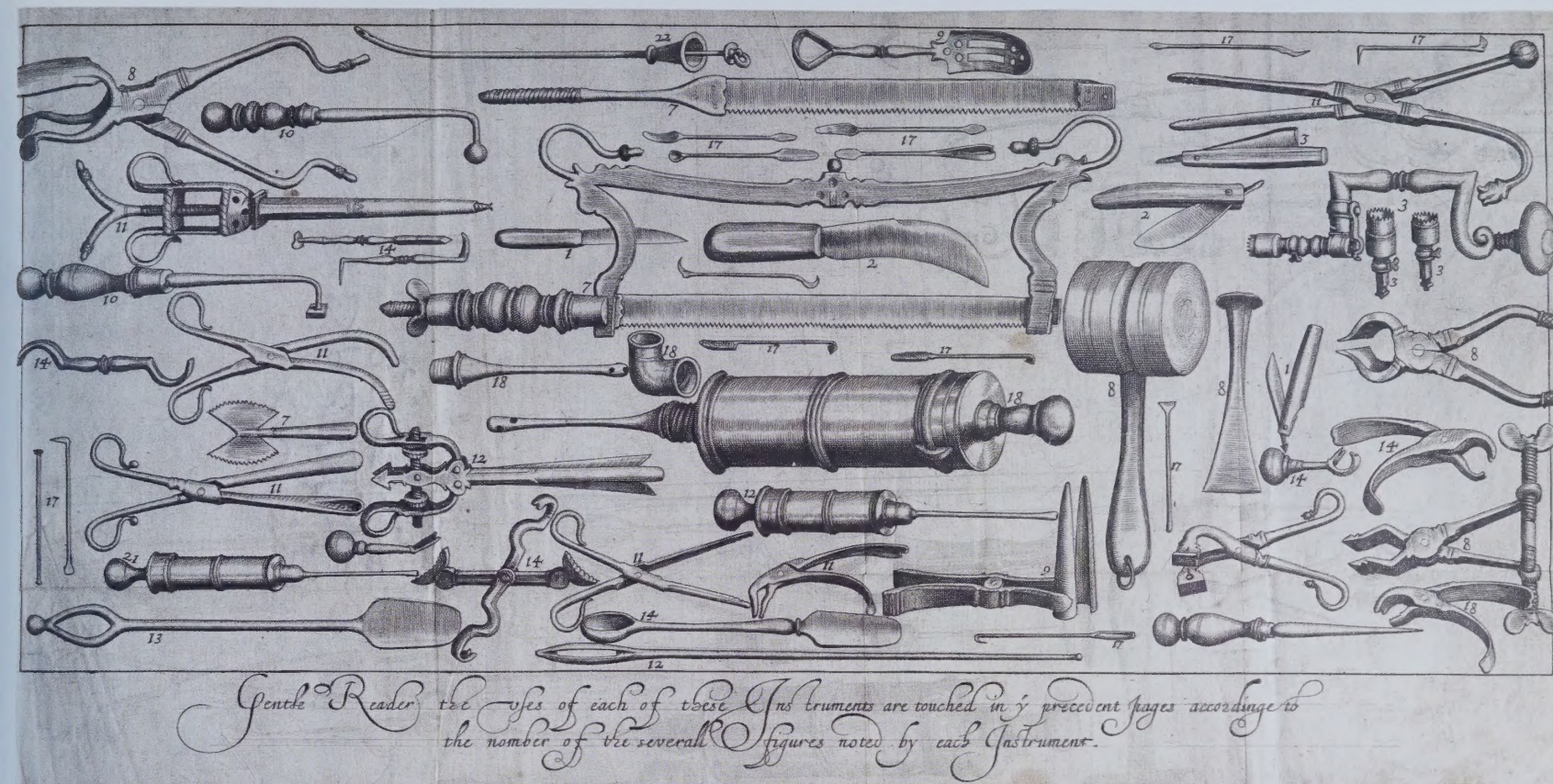
21 Gaspare Tagliacozzi (1545-1599). *De curtorum chirurgia per insitionem, libri duo. Venetiis [Venice]: Apud Robertum Meietum, 1597.*

Tagliacozzi studied medicine under Girolamo Cardano at Bologna, where he subsequently became professor of surgery and anatomy. Although plastic surgery was known in ancient India and elsewhere, this is the first book devoted entirely to rhinoplasty. The twenty-two full-page illustrations, which Tagliacozzi went to great expense to have printed, show the individual steps of various restorative operations, as well as the instruments and contraptions used. The author also discusses surgical complications such as haemorrhage and acute infections. The book is open to a woodcut illustration of a surgical patient with a skin flap transplanted to his lip, with bandages supporting his arm in place.

Tagliacozzi was condemned for "meddling with the handiwork of God", and after his death his body was exhumed, and reburied in unconsecrated ground. Tagliacozzi's work became virtually forgotten until the revival of plastic surgery in the early nineteenth century.



21



22 John Woodall (1556?-1643). *The Surgions Mate, or, A Treatise Discovering faithfully and plainly the due Contents of the Surgions Chest, the Uses of the Instruments, the Vertues and Operations of the Medicines, the Cures of the most frequent Diseases at Sea.* London: Printed by Edward Griffin for Laurence Lisle, 1617.

In his capacity as surgeon-general to the East India Company, John Woodall was commissioned by his employers to write a guide for novice surgeons' mates, usually articulated apprentices, who were called upon to treat medical and surgical emergencies during the long sea journey from Britain to the East. *The Surgions Mate* provides details for the fitting and furnishing of the surgeon's chest with medicines, instruments, and such sundry medical items as bandages and tourniquets. Woodall recommends about seventy-five instruments to be taken on board for use in the treatment of various kinds of wounds, burns, abscesses, ulcers, fractures, dislocations, bowel obstructions, as well as those to be used in such surgical procedures as trepanning and amputation. Over 270 medications are included to treat a variety of ailments, and potentially fatal diseases such as dysentery, enteritis, worm infestation, fevers, and scurvy. The engraved plate showing an array of surgical instruments served as a template for instrument makers.

23 Joannes Scultetus (1595-1645). *Χειροπλοθηκη, seu Armamentarium chirurgicum.* Hagæ-Comitum [The Hague]: Ex officina Adriani Vlacq, 1656.

After obtaining his medical degree in 1621 from the University of Padua, where he studied under Fabricius ab Aquapendente and Adriaan van de Spiegel, the German surgeon Joannes Schultes [Scultetus] served as a field surgeon in the Thirty Years' War before settling as a practitioner in Ulm. His *Armamentarium chirurgicum*, first published posthumously at Ulm in 1655, under the editorship of his nephew, was to become the most popular surgical text of the seventeenth century, going through numerous editions and translations, including an English version in 1674 with the title *The chyrurgeons store-house*. The forty-three finely engraved plates display the ingenious devices invented by Scultetus, who is remembered eponymically for the inclined position assumed by the patient in the operation of herniotomy. In addition to the description of surgical instruments, the work demonstrates methods of dressing and bandaging. It also shows graphically a number of surgical procedures and is accompanied by one hundred of the author's case notes.

Plate 31 indicates the instruments required to perform a craniotomy, as well as the various stages of the operation and post-operative dressing. Plate 43 (from the 1662 edition) shows the



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bandages to be used in abdominal bandaging, various surgical appliances and instruments devised by Scultetus, and also demonstrates methods for surgical incisions. In both plates the patients do not seem unduly traumatized by their experiences.

24 Lorenz Heister (1683-1758). *A General System of Surgery in three parts*. London: Printed for W. Innys; C. Davis; J. Clark; R. Manby; and J. Whiston, 1743.

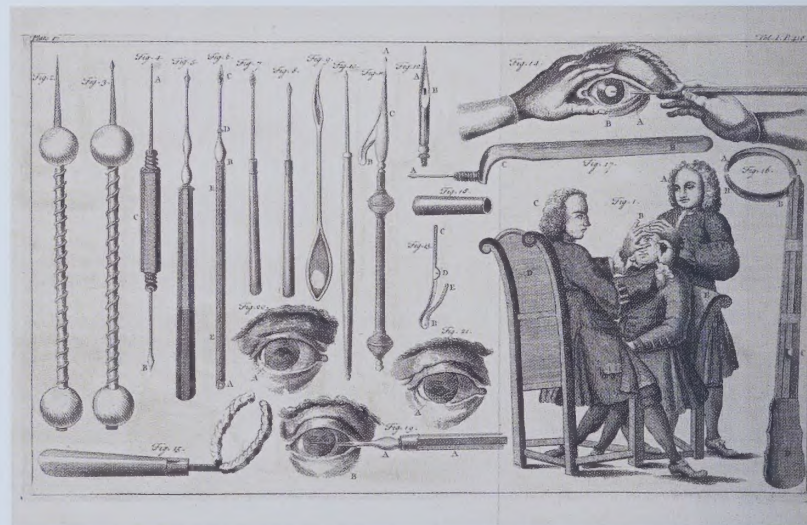
Lorenz Heister (1683-1758) was one of the foremost surgeons in Germany during the eighteenth century. After receiving his surgical training in Germany and the Netherlands, he worked as an apprentice under Frederik Ruysch, who sponsored his appointment as chief surgeon of the Dutch Army. Returning to Germany in 1710, he took up a position as professor of anatomy

and surgery firstly at the University of Altdorf, and later at Helmstadt. In 1718 his celebrated book on surgery was published in Germany in his native tongue, and was rapidly translated into the major European languages, thereby making it the most popular surgical text of the eighteenth century.

The thirty-eight engraved plates show a wide variety of instruments, bandaging, and surgical procedures which were of inestimable value to practitioners. Each plate is keyed to a brief textual commentary. Some combine the instruments of surgery with operative techniques, which added greatly to the popularity of the book and made for ease of use. Included are the methods and instruments used in such operations as couching a cataract, lithotomy, mastectomy, and amputation. The book is open to a plate showing amputation of an arm and a leg.



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25 Frederik Dekkers (1644-1720). *Exercitationes practicae circa medendi methodum*. Editio altera. Lugduni Batavorum [Leiden]: Apud Jordanum Luchtmans [et] Cornelium Boutesteyn, 1695.

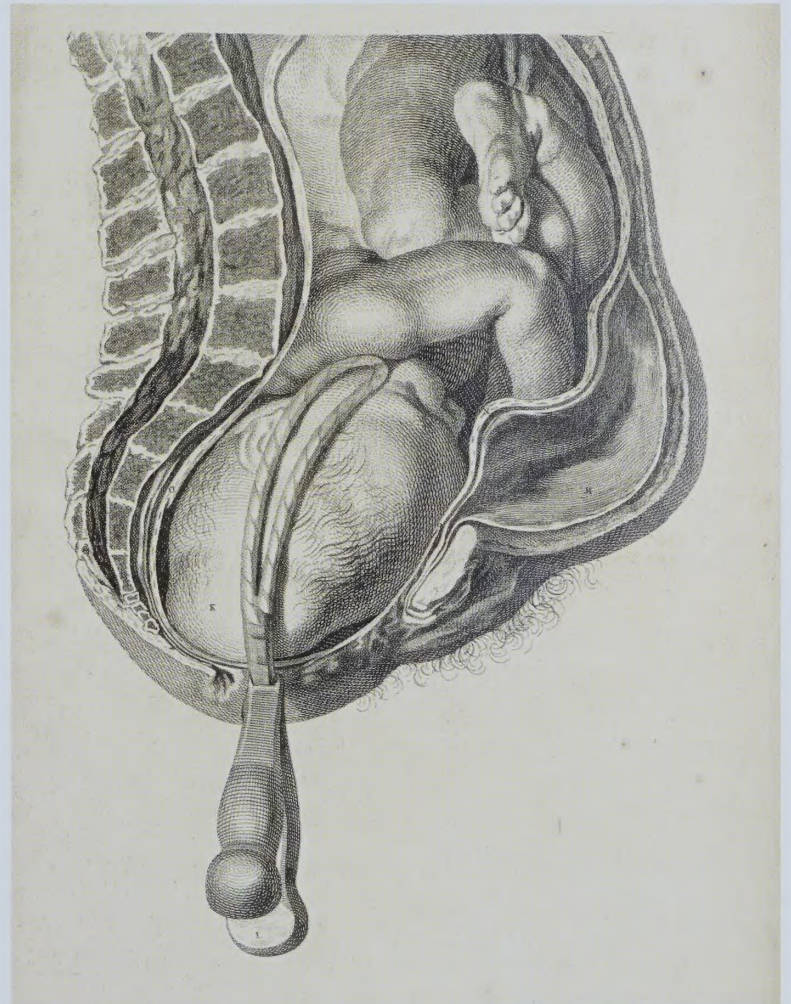
Dekkers, who studied under Franciscus de La Boe at Leiden, graduating in 1668, was appointed Professor of Practical Medicine at Leiden in 1694, a position he held for thirty years. His *Exercitationes* was first published 1673, with subsequent editions in Latin, Dutch and French.

Among the diseases depicted are arthritis, rickets, abdominal cysts, hydrocele, and tumours of the legs and buttocks. The plate displayed here shows the treatment of a forty year old woman, mother of five children, suffering from acute ascites (dropsy of the abdomen). She has had wicks inserted with the aid of a needle, to drain the accumulated fluids. Her legs and feet also show edema.

Obstetrics

26 William Smellie (1697-1763). *A Sett of Anatomical Tables with Explanations, and an Abridgement, of the Practice of Midwifery, with a View to Illustrate a Treatise on that Subject, and Collection of Cases*. London: [D. Wilson], 1754.

William Smellie, one of the greatest figures in British obstetrics, began his professional career as apprentice to John Gordon of Glasgow, before moving in 1741 to London, where he became famous as a practitioner and teacher of obstetrics. As a teacher he attracted a large number of students from all over Britain and the Continent, including Pieter Camper and William Hunter. Between 1741 and 1751 he is said to have trained over nine hundred students.



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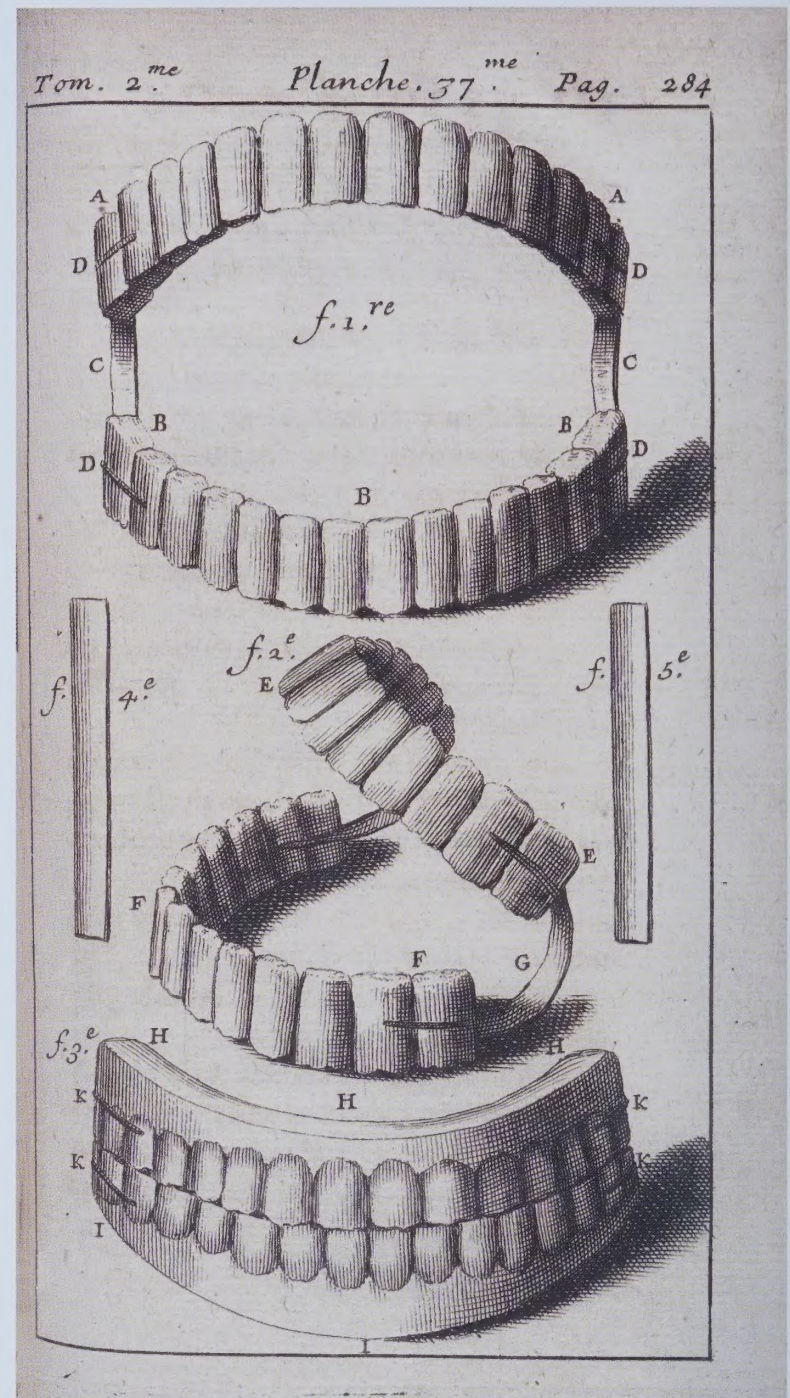
In 1752 Smellie published the first volume of his *A Treatise on the Theory and Practice of Midwifery*, a summary of his experience in obstetrics. It describes, among other things, the mechanical aspects of parturition, in both regular and irregular births, and details improvements to obstetrical forceps with clinical indications for their proper use. Two volumes, describing 531 case histories, followed in 1754, and were reissued posthumously in 1764, edited by his friend and one time pupil Tobias Smollett, who began a medical career, only to abandon it for literature.

A Sett of Anatomical Tables was published by subscription in 1754 in an edition of one hundred copies at a cost of two guineas a set. A second edition appeared in 1764, with the spelling of “set” in the title normalized. Other editions appeared in 1785 and 1792. The original edition contains thirty-nine life-size plates comparable in excellence to those in *Anatomia uteri humani gravidi* by Smellie’s pupil, William Hunter. Twenty-five of the plates were drawn by Jan van Rymsdyk, who also executed the drawings for Hunter’s great obstetrical atlas. The engraver was G. Grignion. At the sale of Smellie’s effects in 1770 following the death of John Harvie, Smellie’s successor as teacher of midwifery, Rymsdyk’s original drawings for Smellie were purchased by William Hunter; they are now part of the Hunterian Collection at the University of Glasgow. Several plates illustrate the use of forceps in delivery, such as plate 21 shown here. A fortieth plate was added to the 1785 edition, edited by Thomas Young, illustrating improvements in obstetrical instruments. The plates were also used (reversed) for the article on midwifery in the first edition of the *Encyclopædia Britannica*, but without acknowledgment to Rymsdyk.

Dentistry

27 Pierre Fauchard (1678-1761). *Le chirurgien dentiste, ou, Traité des dents*. Paris: Chez Jean Mariette, 1728.

With the publication of *Le chirurgien dentiste* in 1728, Fauchard presents, in a single work, an integrated doctrine of dentistry, providing it with a solid scientific foundation. Drawing on the publications of leading surgeons and anatomists, on the practical knowledge of tooth-drawers, and on his own considerable experience, Fauchard treats the numerous and varied aspects of dentistry from the historical, theoretical, and practical standpoints. Considerable space is devoted to anatomy, and to the care and hygiene of the teeth. In a lengthy discussion of the pathology of over one hundred dental, alveolar and gingival diseases, Fauchard takes the opportunity to dispel several age-



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old myths, such as the tooth worm, and many of the dubious remedies against toothache. He is also critical of the cauterization of decayed teeth with acid, as advocated by many dentists at that time.

In discussing dental surgery Fauchard deplores the relative lack of formal training, and emphasises the need for a thorough theoretical knowledge, in addition to a skilful hand. The relative positions of patient and dentist are carefully delineated, and the instruments used in various operations and in the cleansing of the teeth are explained in detail with illustrations.

The sections dealing with prostheses are of great interest, as they include Fauchard's own inventions and improvements to dentures. In addition to using hippopotamus tusk, walrus ivory, ox bone, and human teeth as substitutes, Fauchard also makes one of the earliest attempts at fashioning artificial teeth from inorganic material (a mixture of bone, metal, and porcelain). A wide variety of dentures and obturators, several of them invented or improved by Fauchard, are also described.

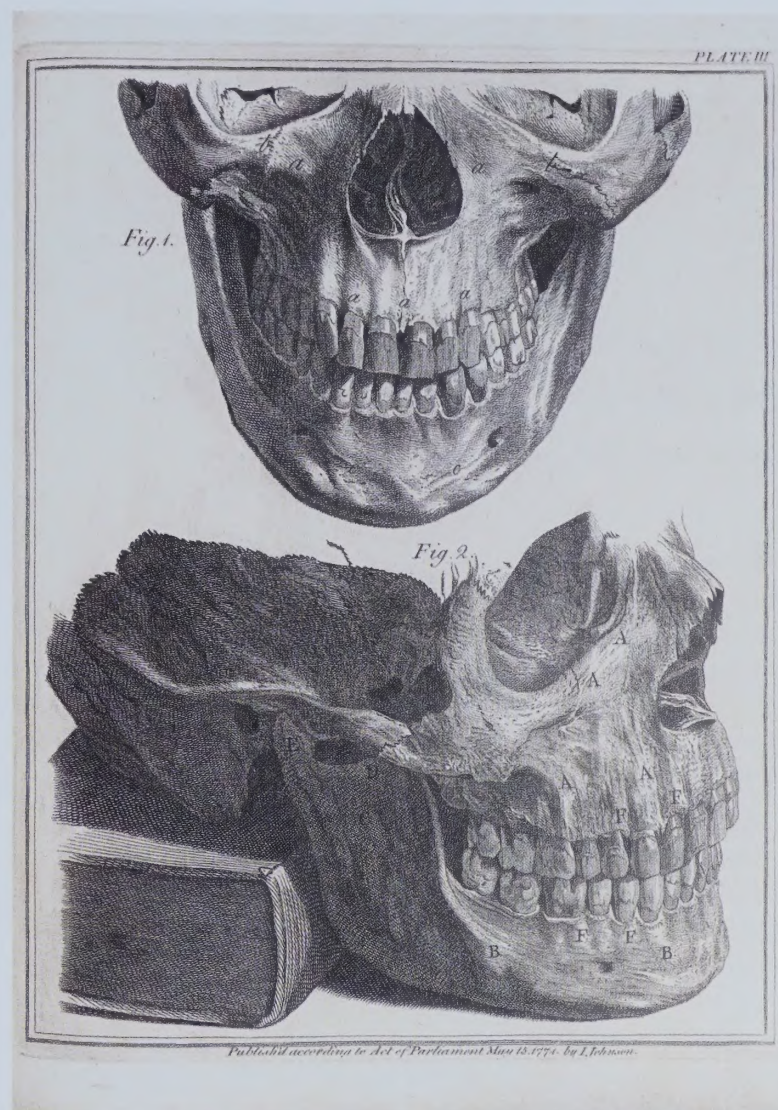
The significance of Fauchard's work was immediately recognised in his native France. Many of his colleagues, encouraged by his example, felt confident enough to reveal their knowledge to the world, and in the course of the century a comprehensive body of dental literature was established, firstly in France, and then in other European countries.

28 John Hunter (1728-1793). *The Natural History of the Human Teeth: Explaining Their Structure, Use, Formation, Growth, and Diseases*. London: Printed for J. Johnson, 1778.

Younger brother of William, John Hunter studied dissection at his brother's school of anatomy in London, where he showed outstanding aptitude as a dissector. He also studied under William Cheselden and Percivall Pott. Later he built up a successful medical practice in London, numbering among his patients the Duke of Queensberry, Sir Joshua Reynolds, Joseph Haydn, Samuel Foote, Lord Byron, David Hume, Adam Smith, Joseph Farington, the Marquess of Rockingham, and Thomas Gainsborough.

Like his brother, John Hunter founded a museum with over thirteen thousand specimens, which he bequeathed to the Royal College of Surgeons. He was also a modest book collector, his collection being sold at auction by Christie's on 1 February 1794.

Hunter's two treatises on the teeth made him one of the founders of modern scientific dentistry. His first book, *The Natural History of the Human Teeth*, was published in 1771. It dealt with the structure of the teeth, and classified them according to the system still in use today. He traced the development of the teeth in the fetus and child, and established their structure of pulp, bone, and enamel. He also introduced modern scientific nomenclature for the teeth. His second work, *A Practical Treatise on the Diseases of the Teeth*, published in 1778, was intended as a supplement to *The Natural History of the Human Teeth*. It examined the pathology of the teeth, alveolar processes and gums. Hunter stated the necessity of removing diseased pulp to ensure the success of filling, and detailed his experiments with tooth



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transplantation. The two works are often found bound together, usually with a cancel title page to the first part, dated 1778. The combined works are illustrated with sixteen plates, drawn by Jan Rymdyk, and engraved by Strange, Ryland, Grignion, Fourgeron, and others. Plate III shows the lower portion of a skull and mandible with full permanent dentition, resting against a book.

A "second edition", made up from sheets of the first edition, with cancel title page, also appeared in 1778. Hunter published only two other books during his lifetime, *A Treatise on the Venereal Disease* (1786), and *Observations on Certain Parts of the Animal Economy* (1786). He had also prepared the manuscripts of three more books at the time of his death. The first, *A Treatise on Blood, Inflammation and Gun-shot Wounds*, was published posthumously in 1794. The other two works, *Observations and Reflections on Geology*, and *Memoranda on Vegetation*, were issued much later, in 1859 and 1860 respectively.

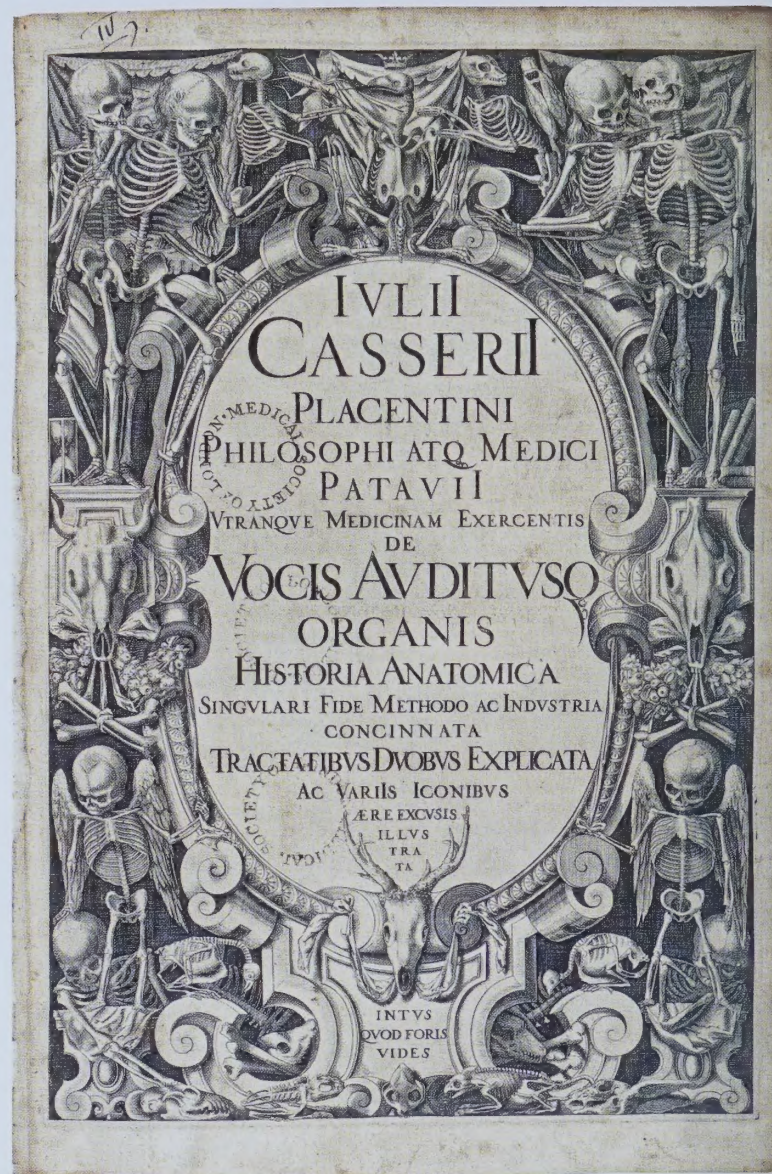
Medical illustration as decorative elements:
title pages, frontispieces, initials and
head- and tailpieces

During the latter part of the sixteenth century the use of elaborate title pages and frontispieces was commonly employed in medical books. They are characterized by designs within architectural frameworks, frequently an anatomical theatre or dissecting room. The frames are embellished with allegorical figures relating to the subject of the book. Figures of Aesculapius, Hippocrates, Galen, etc. might be incorporated into the design. Much of the accompanying imagery is grotesquely macabre, in the form of skulls and crossbones, articulated skeletons, various internal organs and body parts, displays of surgical instruments, and the animals often associated with medicine.

By the eighteenth century the elaborate baroque designs of the previous century were replaced by a simpler more elegant decoration, reflecting the taste for the neo-classical aesthetic. Small title-page vignettes, in keeping with the overall proportions of the page, and harmonizing with the typography, replace the heavily decorated engraved or woodcut title pages. Small engraved vignettes framed with floral motifs or scrollwork often embrace mythological scenes in rustic settings. Cupids and putti, holding lyres, pallets, and globes representing various arts and sciences, and occasionally engaged in miscellaneous medical pursuits, replace the *memento mori* of the previous age. Other vignettes echo the earlier motif of the anatomical theatre.

Other elements of design are historiated initial letters and head- and tailpieces that introduce or close a chapter or section of a book. Often whimsical, they add a light-hearted or humorous element to the subject.

29 Giulio Casserio (ca. 1552-1616). *De vocis auditusq; organis*. Ferraræ [Ferrara]: Excudebat Victorius Baldinus, 1601.



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Written by Giulio Casserio, one of the leading personalities in the golden age of anatomy at Padua, *De vocis* is a comparative anatomy of the vocal and auditory organs in humans and a variety of animals. It includes a detailed account of the larynx, and the first accurate description of the laryngeal muscles and nerves, and is adorned with thirty-four plates, executed by the German artist Joseph Maurer, under Casserio's direction.

The contents of the book are announced in the extravagantly baroque title page, engraved by Jacopo Ligozzi (1547-1626). It depicts skeletons, part or whole, of several of the beasts represented in the work; they include the skulls of ox, horse, dog, and deer, a tailless monkey, and several ornithological specimens. At the top of the collage is a cicada, whose characteristic sound is also discussed by Casserio. More fanciful are skeletons of two putti with wings. Other human skeletal figures are represented as affectionate couples.



30

30 Pieter Paaw (1564-1617). *Succenturiatus anatomicus, continens commentaria in Hippocratem, De capitis vulneribus: additæ in aliquot capita libri VIII. C. Celsi Explicationes. Lugduni Batavorum [Leiden]: Apud Iodocum Colster, 1616.*

After completing his medical studies at Leiden, Paris and Padua, in 1589, at the age of twenty-four, Pieter Paaw was appointed to the position of anatomist-surgeon at the Univer-

sity of Leiden, where he was to play a major role in establishing Leiden as one of the leading medical schools of Europe. Paaw instituted a course in practical anatomy, conducting his first dissection in 1589 in a deconsecrated convent church of the Béguines. Realising the need for a permanent anatomical theatre, he set about converting the church. Based on the theatre at Padua built by Fabricius, under whom he had studied, Paaw erected a tiered amphitheatre in the apse of the church with a dissecting table in the centre. It was completed in 1593.

The theatre is shown in this plate depicting Paaw's anatomy lesson, engraved by Andreas Stock (ca. 1580 - ca. 1648) after a painting by Jacques de Gheyn (1565-1629). When compared with other contemporary images of the theatre, some inaccuracies are evident, indicating that de Gheyn was most likely working from memory. The scene of the anatomy theatre clearly makes references to the famous title page of Vesalius' great work, with the *memento mori* of the presiding articulated skeleton, the audience of varied races engaged in lively dispute, the animals in the foreground awaiting dissection, and the figure of Paaw himself holding centre stage, instructing as he dissects.

31 Robert Fludd (1574-1637). *Anatomiae amphitheatrum effigie triplici, more et conditione varia, de signatum*. Francofurti [Frankfurt am Main]: Sumptibus Johannis Theodori de Bry, 1625.



Robert Fludd studied medicine, alchemy, and the occult sciences in England, France, Germany, Spain, and Italy, before receiving his M.D. from Christ Church Oxford in 1605. He was admitted to the Royal College of Physicians of London in 1609. Fludd's mystical views were based on the notion of a double centrality of the universe, consisting of the macrocosm and microcosm. The latter was constituted by the earth surrounded by the sun, moon, and planets, while the macrocosm was represented by the sun situated between the centre of the earth and God. The seat of the Holy Spirit was in the sun from which emanated light and life.

This outlook is expressed in *Anatomiae amphitheatrum*. The work is divided into three parts, introduced by an engraved illustrated title page. The first part is devoted to wheat and chemical experiments to extract its essence, and is represented by the apparatus shown in the illustration on the left. The second part examines human anatomy and is represented by the dissection scene on the right. The third part treats "mystical anatomy", by which Fludd understood the spiritual properties and significance of the individual parts of the body, in particular the blood, seminal fluid, and the brain, and is symbolized in the upper medallion by the four winds each guarded by an archangel surrounding the sacred monogram.

In contrast to the somewhat crude woodcut illustrations of parts 1 and 3, part 2 is embellished with copper-plate engravings, which were first used in Caspar Bauhin's *Theatrum anatomicum*, also published by De Bry, in 1605. For reasons of economy, and against Fludd's wishes the plates were reprinted for *Anatomiae amphitheatrum* along with an apology from Fludd.

32 Jean Riolan (1580?-1657). *Encheiridium anatomicum et pathologicum*. Lugduni Batavorum [Leiden]: Ex officina Adriani Wyngæarden, 1649.

Jean Riolan, the son of Jean Riolan, senior (1539-1606), a leading member of the Medical Faculty of Paris, received his medical degree in 1604. He was appointed to the new chair of Anatomy and Botany at the University of Paris, and to the chair of Medicine at the Collège Royale. In 1633 he became the principle surgeon to the Queen Mother, Marie de' Medici. A conservative in medical matters, defending Galenic orthodoxy, Riolan opposed Harvey's theory of the circulation of the blood, positing his own theory to which Harvey responded in print.

The illustrated title page, engraved by Reinier van Persijn, depicts five eminent anatomists engaged in dissecting a cadaver. To the left of a cupboard of surgical instruments stands Aesculapius, god of healing, dressed as a scholar and accompa-



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34 Nathanael Highmore (1613-1685). *Corporis humani disquisitio anatomica in qua sanguinis circulationem in quavis corporis parte, plurimis pypis povis, ac ænigmatum medicorum succincta dilucidatione*. Hagae-Comitis [The Hague]: Ex officina Samuelis Broun, 1651.

One of the founding members of the Royal Society, Highmore received his M.D. from Oxford in 1643. He was a loyal disciple of Harvey, with whom he conducted experiments on the embryonic development of the chick while at Oxford. *Corporis humani disquisitio anatomica* was destined to become the standard anatomical textbook in England for many years. It contains the first description of the antrum (the maxillary sinus, largest of the paranasal sinuses), and of the corpus Highmori (the mediastinal testis). Dedicated to Harvey, it was the first medical work to accept Harvey's theory on the circulation of the blood, which is incorporated into the allegorical title page, depicting the human body as a garden irrigated by a supply of blood from the heart through the system of veins and arteries. Highmore's work helped the spread of Harvey's ideas in Britain and abroad.

35 Johann Vesling (1598-1649). *Syntagma anatomicum*. Editio novissima. Trajecti ad Rhenum [Utrecht]: Apud Antonium Schouten, 1696.

Vesling, who studied at Leiden and Bologna, was Professor of Anatomy at Padua from 1632 to 1638, after which he devoted his energies to botany. His *Syntagma anatomicum* was first published in octavo at Padua in 1641, without illustrations. It was reissued in quarto with illustrations in 1647. A very popular textbook used in all the universities of Europe for half a century, it went through many editions and was translated into several languages, including an English version by Nicholas Culpeper in 1653. Vesling provides a sound description of the chyle vessels (lacteals), and affirms that there are four pulmonary veins emptying into the left auricle of the heart.



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The twenty-four copper engravings, from drawings by Giovanni Georgi, are formal representations of anatomy, with no landscape background. The frontispiece to the 1647 edition (reused in the 1651 edition) shows a dissection being



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performed by Vesling in the anatomical theatre at Padua. The frontispiece to later editions, as in the one on display, shows Vesling instructing a group of gentleman; above his head is an array of surgical instruments.

36 Antonio Maria Valsalva (1666-1723). *De aure humana tractatus*. Bononiæ [Bologna]: Typis Constantini Pisarii, 1704.

Valsalva studied medicine at Bologna under Malpighi. Later he became the teacher of Morgagni, who edited his collected works (Venice, 1740). In 1697 he became Public Engraver of Anatomy at Bologna, and in 1705 lecturer and demonstrator in anatomy, a position he held until his death. Besides his anatomical achievements, Valsalva was among the first to advocate humanitarian treatment of the insane.

In *De aure humana*, Valsalva gave the first account of the minute anatomy of the human ear. He was also the first to define the three regions of the ear, outer, middle, and inner, and their relative functions. He also described the outer auricular muscles, and the hammer and tube in the middle ear. Valsalva named the Eustachian tube which connects the middle ear with the pharynx.



36

The work is illustrated with ten copper engravings, as well as decorative woodcut initials. A striking example of the latter is the initial letter "C" which follows the contours of the external ear.

37 William Cowper (1666-1709). *Myotomia reformatata, or, An Anatomical Treatise on the Muscles of the Human Body*. London: Robert Knaplock, William and John Innys, and Jacob Tonson, 1724.

Cowper began his apprenticeship to a surgeon in London in 1682, and was admitted as a barber-surgeon in 1691.

First published in 1694 in octavo, with only ten plates, *Myotomia reformatata* was reissued in 1724 in folio, greatly expanded and enlarged, with sixty-six engraved plates, and a long introduction on the muscles and their action. The plates were finished, and a draught text prepared by Cowper shortly before his death in 1709. He left instructions for Richard Mead to publish the work. *Myotomia* was eventually issued thirteen years after Cowper's death, edited by Mead and James Jurin, Secretary to the Royal Society.

The beautiful engravings, some after Rubens, Raphael, and Reni are among the finest anatomical plates ever produced. In addition *Myotomia* contains interesting decorative initials and head- and tailpieces. Unlike the muscle men used as head- and tailpieces that are purely decorative and appear repeatedly, the initial letters are mostly specific to the chapter they introduce. The letter "G" which begins the chapter of the eye, is built around the muscles of the eyelid. Shown here is the decorative initial "V" which opens the fifth chapter dealing with the muscles of the anus. The spread legs of the *ecorché* figure form an inverted V that counterbalances the engraved letter.



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Medical illustration in colour

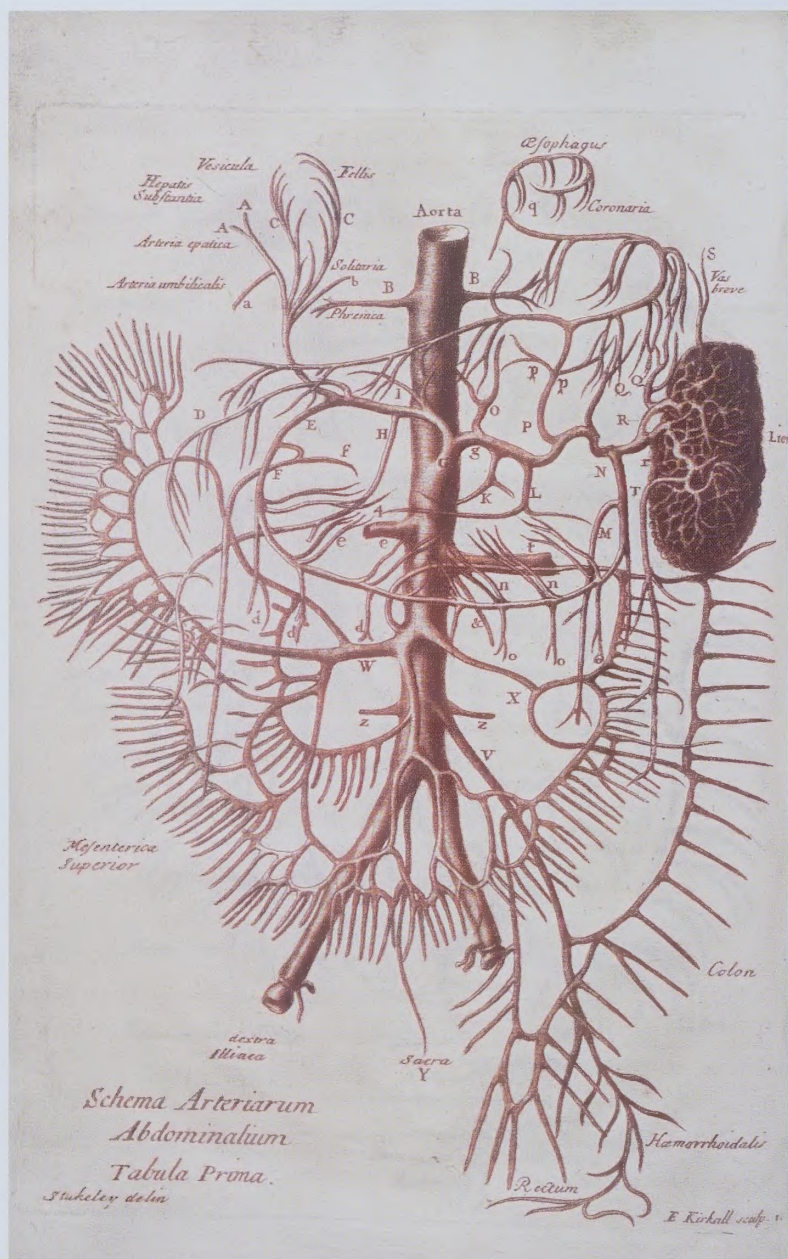
38 Govert Bidloo (1649-1713). *Anatomia humani corporis*. Amstelodami [Amsterdam]: Sumptibus viduæ Joannis à Someren, hæredum Joannis à Dyk, Henrici & viduæ Theodori Boom, 1685.

Attempts to print in colour were made prior to the eighteenth century, with limited degrees of success. The first medical book to contain a colour illustration was Gasparo Aselli's *De lactibus, sive Lactis venis* (Milan, 1627), which includes a chiaroscuro woodcut in black, red, and two shades of brown. Before the development of multiple colour printing in the eighteenth century, almost all colouring had to be done by hand – a labour-

intensive and time-consuming process. Medical books intended for presentation were sometimes hand-coloured at the author's expense, a spectacular example being the copy of Vesalius, once in the Haskell Norman Collection, and sold at auction by Christies of New York in 1998. It is described in the catalogue of that collection as well as in the Christies' sale catalogue. Even after the introduction of colour-printing, many illustrations continued to be coloured by hand, and it is frequently difficult to distinguish one method from the other. This copy of the first edition of Bidloo has been partially coloured by hand. Plate 56, showing the adominal organs, uterus and placenta and fetus of a pregnant woman, has been finished in watercolours.

39 William Stukeley. *Of the Spleen, its Description and History, Uses and Diseases, particularly the Vapors, with their Remedy. Being a Lecture read at the Royal College of Physicians, London, 1722. To which is added some Anatomical Observations in the Dissection of an Elephant.* London: The author, 1723.

Antiquary, natural philosopher, and physician, William Stukeley studied medicine at Cambridge, receiving his M.D. degree in 1720. Two years earlier he had been made a fellow of the Royal Society where he formed friendships with Richard Mead, Sir Hans Sloane, Edmond Halley, William Whiston, and Martin Folkes. His strongest friendship, however, was formed with Sir Isaac Newton, who first told Stukeley the anecdote about the falling apple. In 1720 Stukeley was elected to the Royal College of Physicians of London where he gave the Goulstonian lecture in 1722 which was printed as *Of the Spleen*



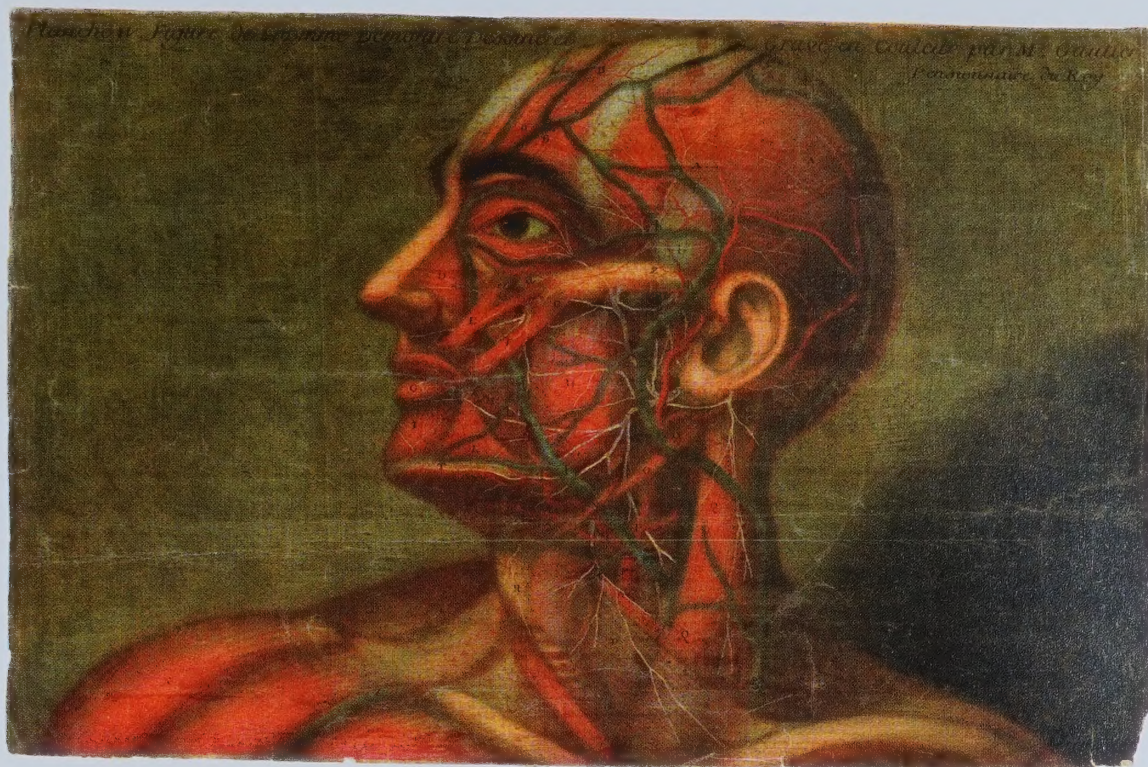
the following year. Appended to this work is the report of a dissection of an elephant he had undertaken with Sir Hans Sloane. Among the engraved plates are two printed in inks other than black, one in green, the other in sepia. Although not technically colour printing, the use of monochrome sepia is used to dramatic effect.

40 Jacques Gautier d'Agoty (1717-1785). *Anatomie générale des viscères en situation.* Paris: Le sieur Gautier, 1752.

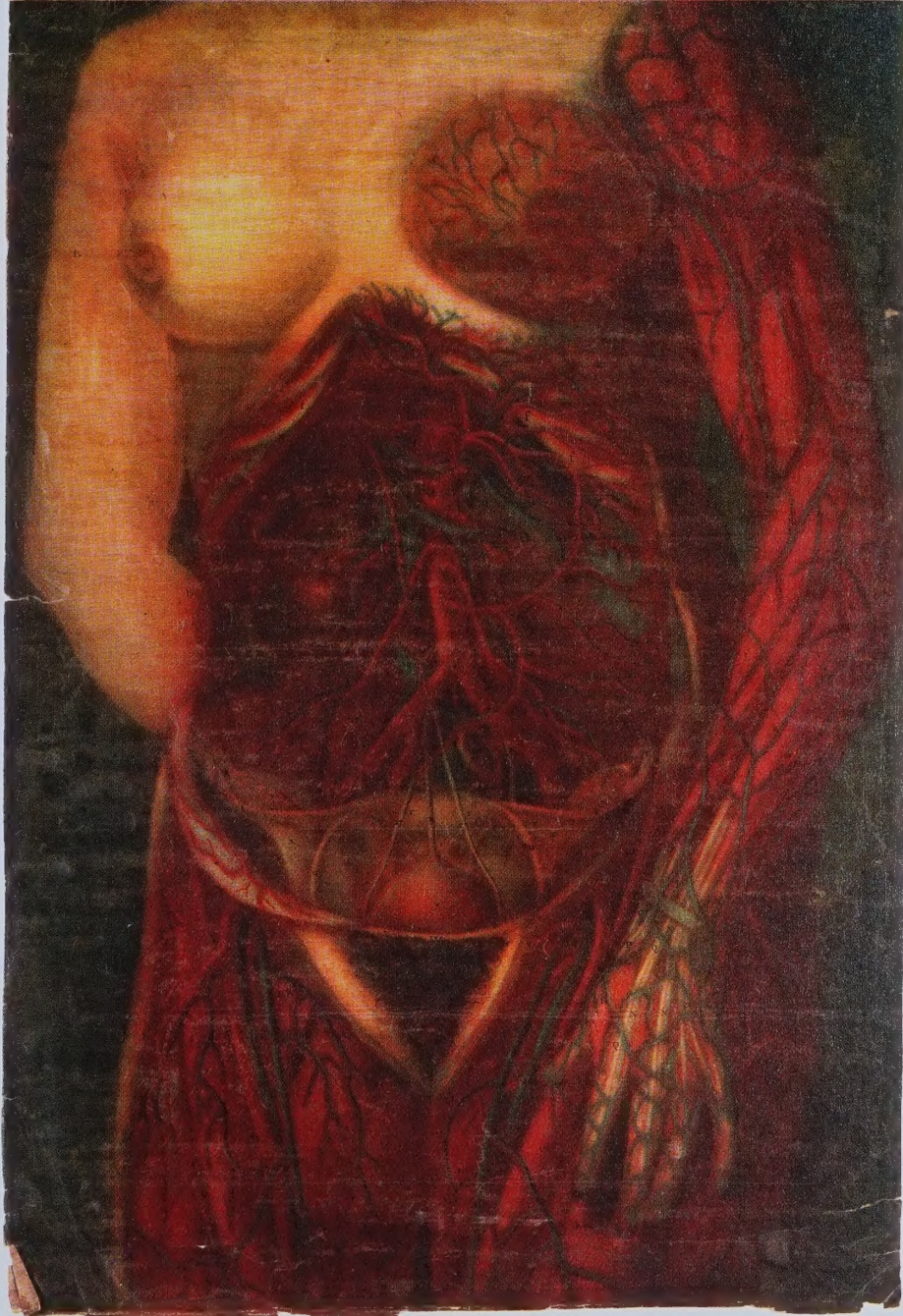
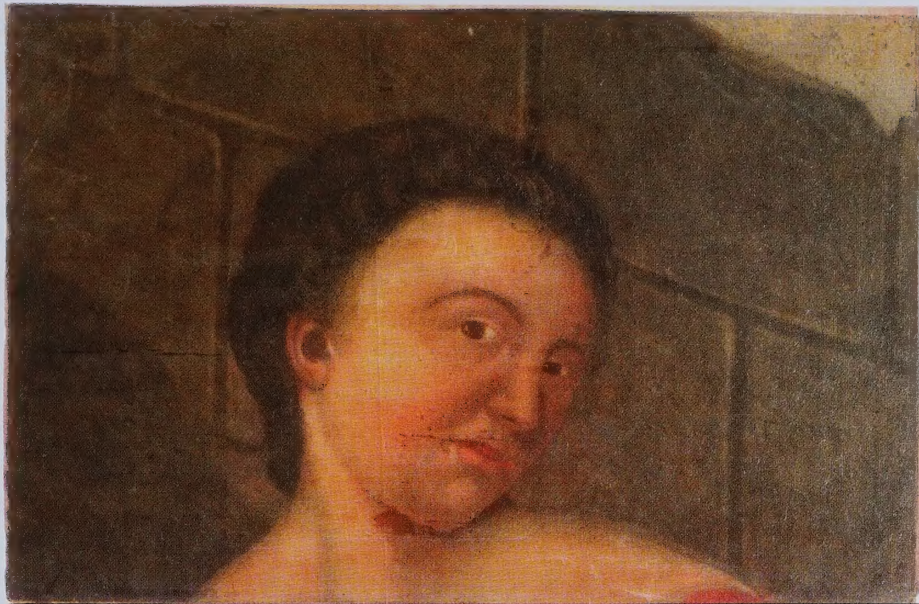
It was not until the publication of Sir Isaac Newton's *Opticks* in 1704, that the development of colour printing began to make significant progress. Newton's treatise provided a sound scientific foundation of colour theory, and it was not long before experimentation in colour printing was attempted. On the Continent the leading experimenter in colour printing was Jacques-Christophe Le Blon (1667-1741), who developed a three-colour method for printing illustrations. By using plates inked in the primary colours of yellow, blue, and red, Le Blon found they could be combined in various ways to produce any desired hue. Each plate was prepared using a mezzotint technique, which provided gradations of shading. Le Blon had acquired a privilege to publish a book of anatomical illustrations, but he died before the project could begin.

One of Le Blon's pupils was Gautier d'Agoty, who extended and appropriated his master's method, by adding a fourth plate in black, which provided additional shades of grey and black. He also adopted Le Blon's ambitious plan to publish colour-printed anatomical plates with descriptive text. In 1745 eight plates of the muscles of the face, neck, head, tongue, and larynx were issued. A further twelve plates of muscles of the pharynx, torso, legs, and arms were published in 1746. The specimens for the illustrations were prepared by Guichard Joseph Duverney (1648-1730), lecturer in anatomy at the Jardin du Roi. The two sets of plates were combined, and issued as *Myologie complete* in 1746. In the dedication and "advertisement" to this work Gautier d'Agoty claimed the invention of four-colour printing as his own, for which he obtained a patent.

Gautier's *Anatomie generale des viscères* included life-size dissected figures, each made up from three separately printed plates. Of little didactic use, the plates frequently possess a certain erotic quality. Dissected parts are placed in a "living" body, with quizzical, serene faces, coiffured according to the fashion of the day. One plate shows a dissected new-born child asleep, lying close to his mother, whose uterus is open to display.









41

41 Edward Jenner. *An Inquiry into the Causes and Effects of the variolæ vaccinæ.* London: Printed for the author by Sampson Low, 1798.

For centuries epidemics of smallpox were the scourge of Europe and the Middle East. In the early eighteenth century the practice of inoculation, or “variolation” as it became known, was introduced into England from Turkey by Lady Mary Wortley Montagu as a preventive against smallpox. Treatment was not always successful and was widely opposed. At the end of the century, Edward Jenner, a country practitioner in Gloucestershire, became aware that milkmaids who had contracted cowpox from cattle, did not develop smallpox. Jenner experimented by injecting lymph removed from Sarah Nelmes, a milkmaid infected with cow pox, into an eight-year old boy, James Phipps. Two months later Jenner injected Phipps with the smallpox virus to which the boy proved resistant. Jenner announced the results of his experiment in this book, which he published at his own expense. Vaccination, as the new procedure became known (from the Latin word for cow – “vacca”) gradually became universally accepted, and laid the foundation for the modern sciences of immunology and virology. Indeed, Jenner was the first to use the word “virus”. In time preventive inoculations against scarlet fever, typhoid, diphtheria, whooping-cough,

bubonic plague, cholera, yellow fever, and tetanus were developed. Today smallpox has been completely eradicated.

Jenner’s *Inquiry* is illustrated by four colour-printed stipple engraved plates, three of the arms and one of the hand of Sarah Nelmes, showing the position and development of the cowpox pustules.

42 Robert Willan (1757-1812). *On Cutaneous Diseases.* London: Printed for J. Johnson, 1808.

Willan, a Yorkshire Quaker, studied medicine at Edinburgh, from where he graduated in 1780. Serving for a short period as physician to the Public Dispensary in Carey Street, London, he left the post for private practice. Among his students were Richard Bright and Thomas Addison.

One of the founders of modern dermatology, Willan classified cutaneous diseases according to their appearance. He pro-



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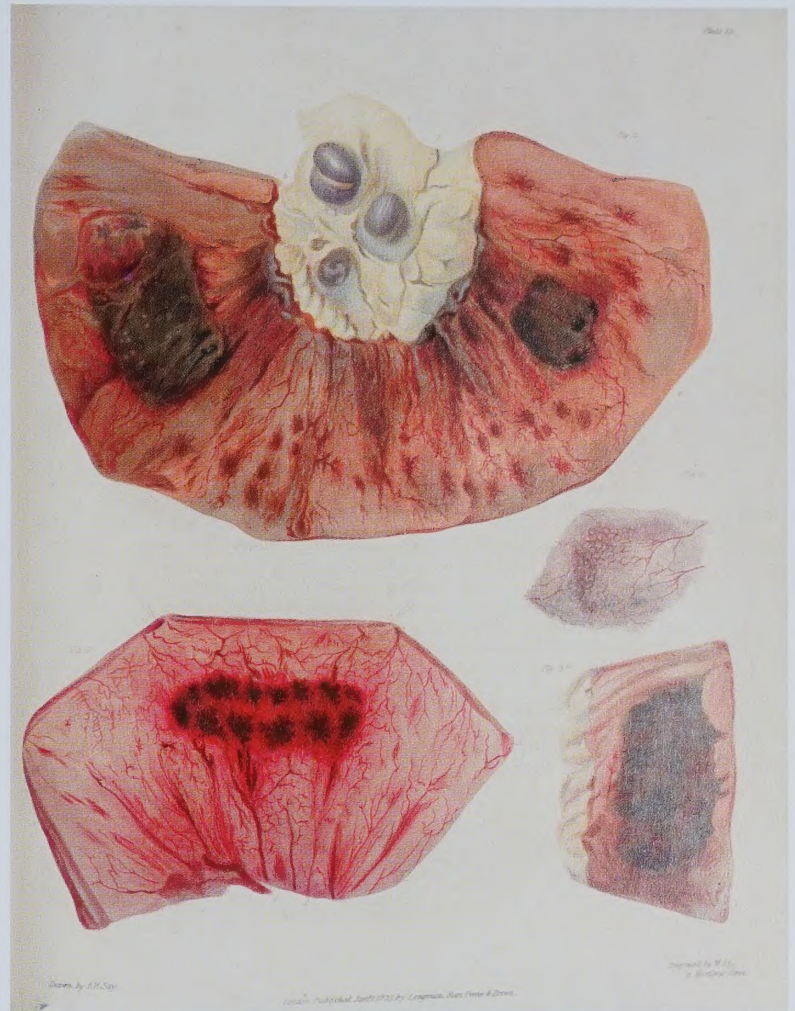
posed eight categories, which he defined as: papular, squamous, exanthematous, bullous, vesicular, pustular, tubercular, and macular. For this system of classification, the Medical Society of London awarded him the Fothergillian Gold Medal in 1790. Willan's work laid the foundation stone of modern dermatology. He was the first to describe several diseases, including impetigo, lupus, psoriasis (also known as "Willan's syndrome"), scleroderma, ichthyosis, sycosis, and pemphigus. Willan, an early supporter of Edward Jenner, published *On Vaccine Inoculation* in 1806, in which he advocated compulsory vaccination.

On Cutaneous Diseases, published serially in four parts between 1798 and 1808, was the first volume of what was to have been a multi-volume definitive work on dermatological diseases. But Willan died shortly after the publication of the first volume, which covered the first four categories of his classification. His student, Thomas Bateman, continued his work, publishing *Delineations of Cutaneous Diseases* in 1817, which included some of the plates which Willan had been unable to use. Willan's book contains thirty-four coloured stipple engraved plates, drawn by Willan, Sydenham Edwards, William T. Strutt, W. Darton, Cruickshank, and Kirtland, and engraved by L. Saillier, Perry and Kirtland. The artists succeeded in producing beautiful illustrations of an unattractive subject, as for example, this plate of a leg infected with ichthyosis.

43 Richard Bright (1789-1858). *Reports of Medical Cases, Selected with a View of Illustrating the Symptoms and Cure of Diseases by a Reference to Morbid Anatomy*. London: Printed by Richard Taylor; published by Longman, Rees, Orme, Brown, and Green, 1827-1831.

Bright began his medical studies at Edinburgh, before moving to London, where he studied under Sir Astley Cooper and James Currie. He received his M.D. from Edinburgh in 1813. In 1820 he was appointed to Guy's Hospital in London, where he made major contributions towards raising the hospital into a great medical educational institution. His remarkable powers of observation enabled him to make many original pathological descriptions, including the symptomology of glomerulonephritis (or, "Bright's disease"). He was also the first to distinguish renal from cardiac edema.

Bright's detailed case reports are models of clarity and precision. The first volume contains descriptions of thirty-three cases of kidney disease, as well as morbid conditions of other organs, and is illustrated with sixteen plates, drawn, under Bright's supervision, mainly by Frederick Richard Say, C.J. Canton, F.F. Giraud, and engraved in mezzotint by the artist's father, William Say, C.J. Canton and William Thomas Fry. The second volume



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includes descriptions of diseases of the brain and spinal cord, illustrated with seventeen hand-coloured engraved plates, and seven uncoloured lithographs. Shown here is incipient ulceration of the small intestines in fever, with tissue samples from the ilium and peritoneum.

44 Sir Robert Carswell (1793-1857). *Pathological Anatomy. Illustrations of the Elementary Forms of Disease*. London: Printed for the author, and published by Longman, Orme, Brown, Green, and Longman, 1838.

Carswell studied medicine at Glasgow and Aberdeen, receiving his M.D. from Aberdeen in 1826. In 1828 he was appointed Professor of Morbid Anatomy at University College, London. He was also physician to the King of the Belgians, and was knighted by Queen Victoria for his services to Louis-Philippe during his exile in Britain.

Carswell spent five years in Paris and Lyon, where he made over two thousand watercolour drawings of diseased tissues, a selection of which were published in *Pathological Anatomy*, originally



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issued in twelve fascicles between January 1833 and January 1838. The atlas, one of the finest pathological atlases ever produced, is notable for the fine artwork of its forty-eight plates, drawn on stone by Carswell from his own watercolours, lithographed by A. Ducot, and Day & Haghe, and hand-coloured. Displayed here is a plate of gangrene of the foot in vivid colours, showing black discoloration of the toes and mortification of the skin and subjacent cellular tissue.

45 Jean Cruveilhier (1791-1874). *Anatomie pathologique du corps humain, descriptions, avec figures lithographiées et coloriées*. Paris: J.-B. Baillière, 1829-1842.

Cruveilhier was the first occupant of the newly established chair of pathology at the University of Paris in 1825. The illustrations in the atlas volume of his *Anatomie pathologique du corps humain*, based on autopsy material from the Salpêtrière and the Musée Dupuytreu in Paris, were lithographed and coloured by



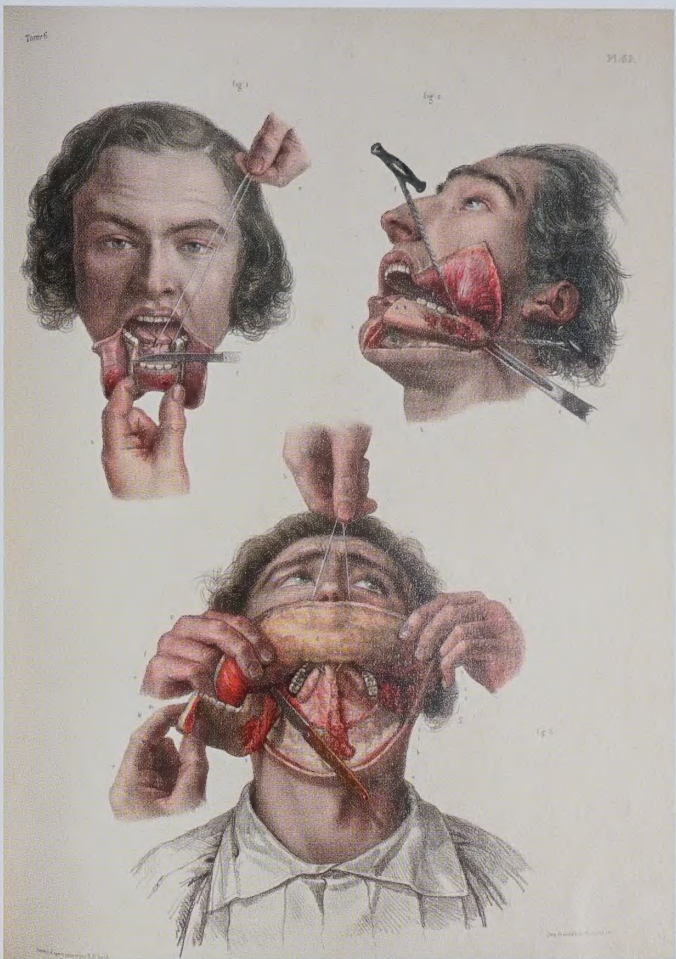
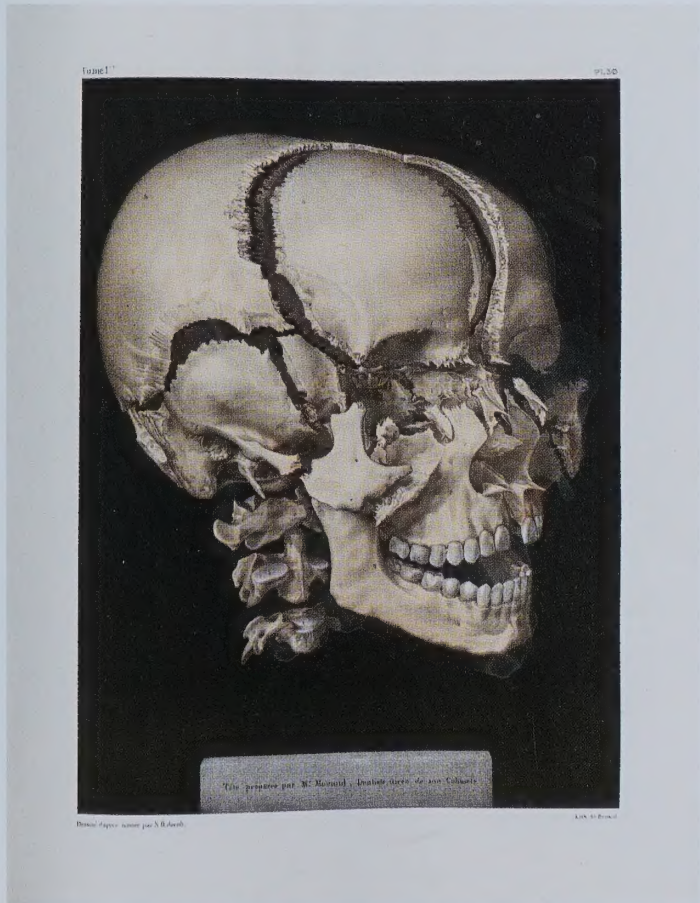
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Antoine Chazal. Among them are original illustrations of multiple sclerosis, auditory neurinoma, intracranial epidermoid, and intracranial and spinal meningiomas. Cruveilhier was also the first to give adequate descriptions of disseminated sclerosis, and progressive muscular atrophy (“Cruveilhier’s palsy”). The two plates displayed here show the pathology of hepatic echinococcosis. The liver is dissected to show multiple cysts – the result of tapeworm infection.

46 Marc-Jean Bourgery (1797-1849). *Traité complet de l’anatomie*. Paris, 1831-1854.

The compilation of Bourgery’s *Anatomie* was encouraged by the great Baron Georges Cuvier. It was issued in eight volumes between 1831 and 1854, and re-issued from 1866-1871 with additional plates and revised text. The work covered the whole of anatomy, beginning with a volume on surgical anatomy, and ending with a volume on embryology and microscopic anatomy. A number of other eminent medical men, including Claude Bernard and Ludovic Hirschfeld, also contributed to the work. The drawings were made by Nicolas-Henri Jacob (1782-1871), transferred to the lithographic stone by Mme. C.A. Jacob Hublier, and lithographed by Bénard & Frey, and Lemerrier.

The lithographic plates display extraordinary clarity and are



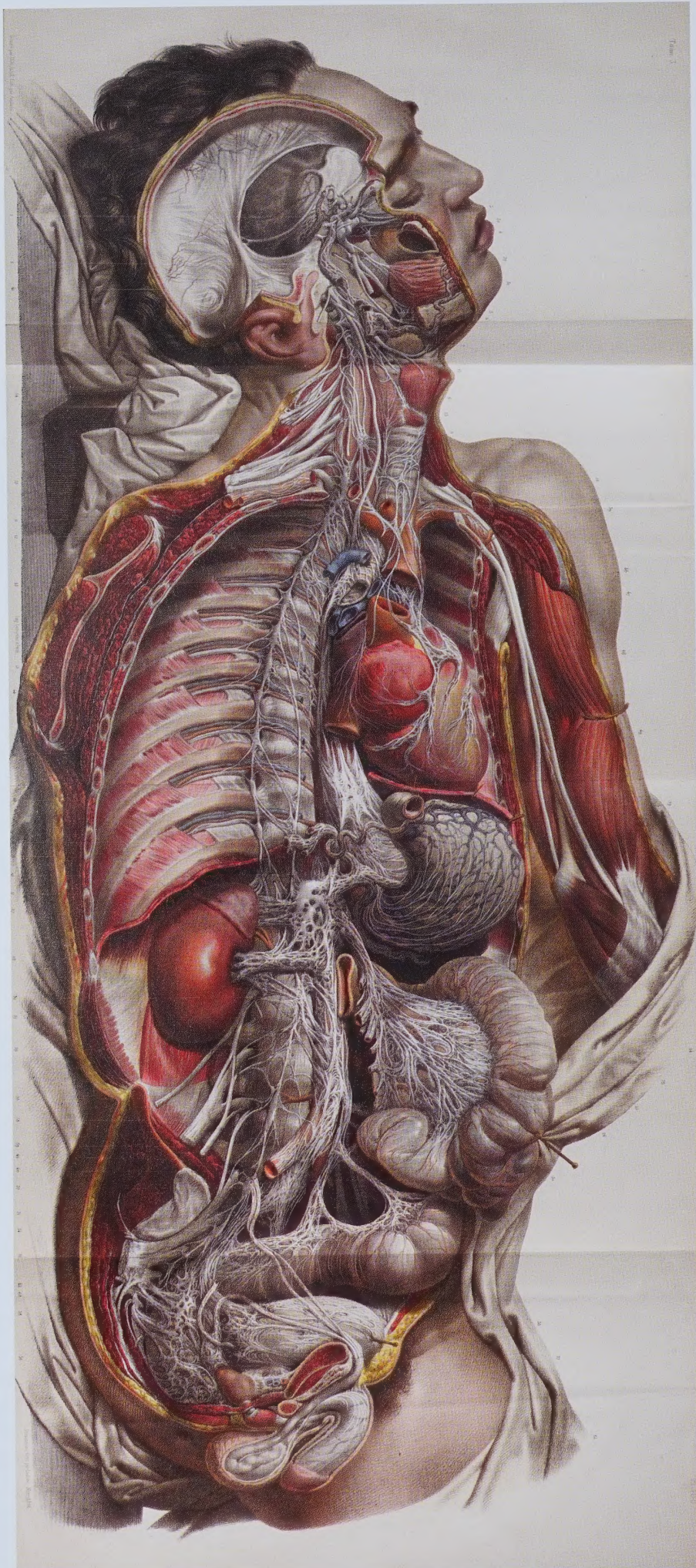
hand-coloured with consummate skill, making the *Traité complet de l’anatomie* one of the finest anatomical atlases ever produced.

The first plate is an antero-lateral view of a disarticulated skull showing the mandible and full permanent dentition.

The second plate presents an anterior view of the veins of the face in situ. Face and neck are dissected to display the jugular vein and the branches of the facial veins.

The large folding plate demonstrates the autonomic nerves of the body in situ. The deep dissection of the head and neck reveal the autonomic pathways. The brain, lungs, liver, and small intestines have been removed to show the cranial nerves, the autonomic plexus in the thorax, abdomen and pelvis.

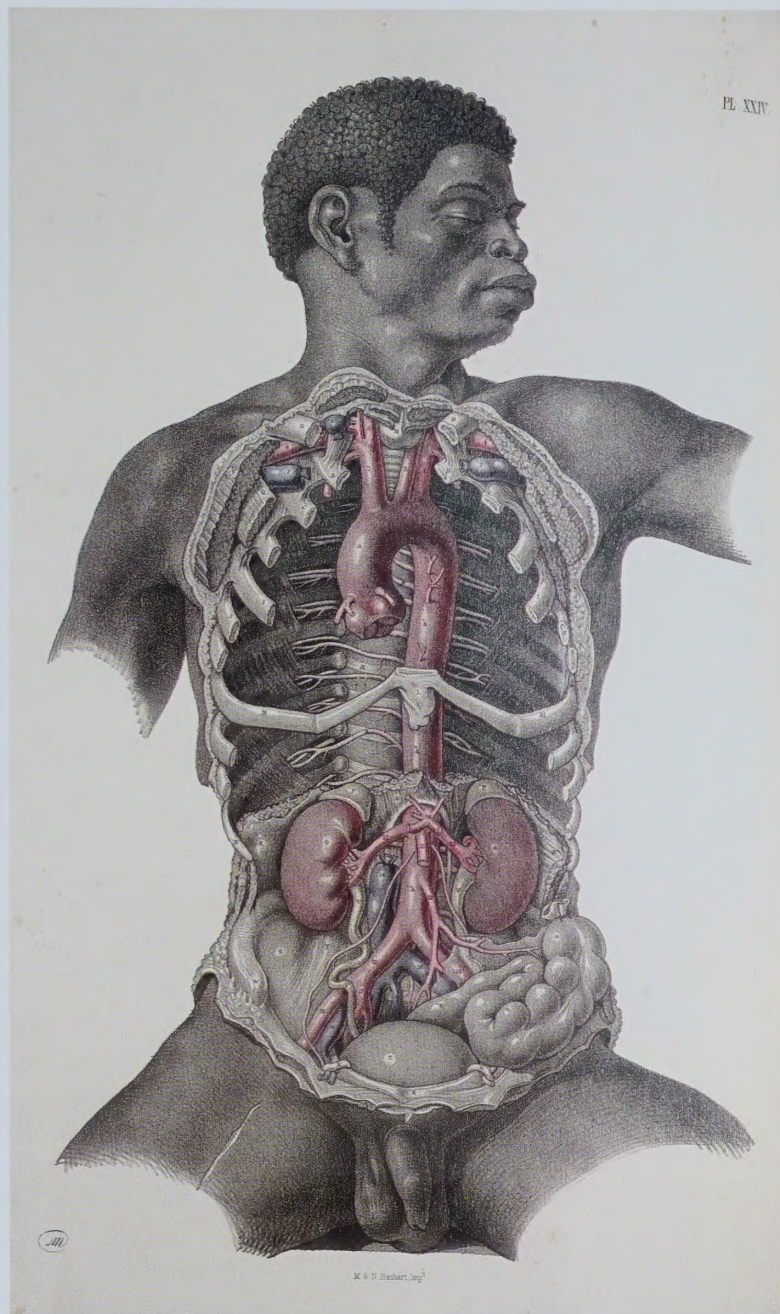
The final plate, from the volume of surgical anatomy, shows the resection of the mandible in three illustrations. The first is an anterior view of the removal of the anterior mandible and lower incisors. The second is a lateral view of the division and removal of the mandible at the ramus. The third is an anterior view of the removal of the entire mandible at the tempromandibular joint.



47 Joseph Maclise (ca. 1815-1880). *Surgical Anatomy*. 2nd edition. London: J. Churchill, 1856.

Joseph Maclise, younger brother of the artist Daniel Maclise, was born in Cork, Ireland. He studied anatomy under Richard Quain at University College, London, and contributed to the latter's *The Anatomy of the Arteries*. In 1851 he published his own volume of thirty-five lithographic plates, many of them hand-coloured. A second edition appeared in 1856, with some plates re-drawn, and seventeen new ones added. An edition published in Philadelphia in 1859 contained sixty-eight plates.

The illustrations to *Surgical Anatomy* were drawn by Maclise from his own dissections performed at University College and at the school of anatomy attached to L'Hôpital La Pitié in Paris. The dissected figures seem almost life-like, with real faces, usually of young men with fair hair. Endowed with great dignity, the figures resemble the romantically noble heroic figures in his brother's paintings, as, for example, this black man, dissected to reveal the thorax, abdomen, and urogenital system. The plates were lithographed by Michael and Nicholas Hanhart. Maclise also published *On Dislocations and Fractures* in 1859, which included thirty-five plates.



THE REWARD OF CRUELTY.



Price 1^d

*Behold the Villain's dire disgrace!
Not Death itself can end.
He finds no peaceful Burial Place;
His breathless Corse, no friend.*

*Torn from the Root, that wicked Tongue,
Which daily smore and curst!
Those Eyeballs, from their Sockets wrung,
That glow'd with lawless Lust!*

*His Heart, expos'd to prying Eyes,
To Pity has no Claim;
But, dreadful, from his Bones shall rise,
His Monument of Shame.*

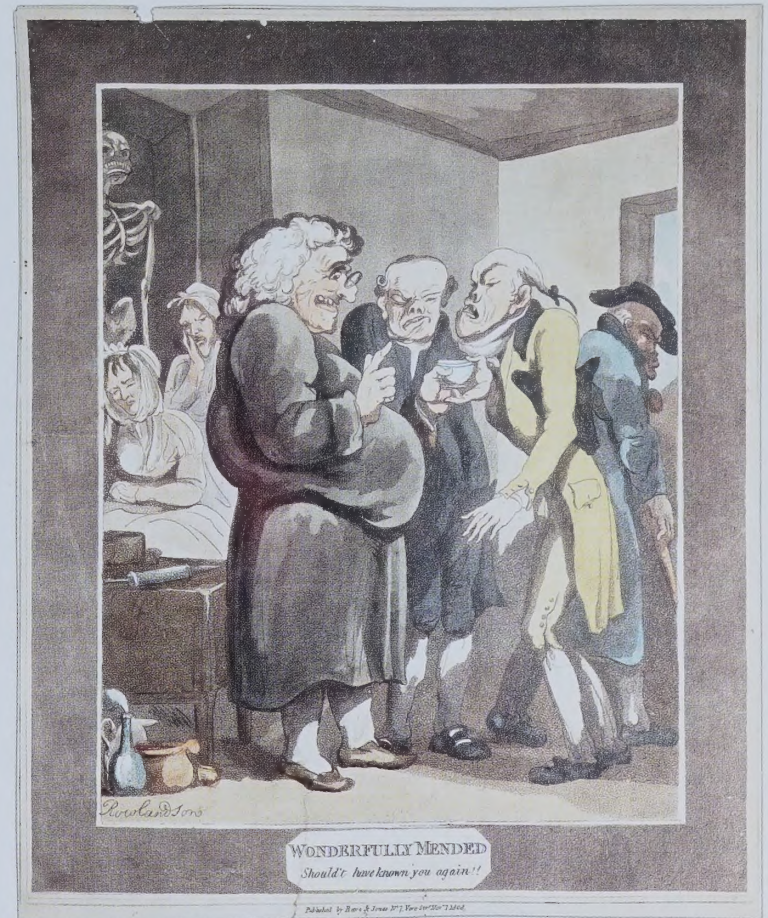
Published according to vote of Parliament Feb. 1753.

Designed by W. Hogarth.



Medical Caricature

Representatives of the medical profession have been subjected to satire since at least the medieval period, possibly because physicians have always been prominent members of their communities, and thus represent easily identifiable targets. During the “golden age” of English caricature, which lasted from about 1780 to 1830, a number of artists, most prominently James Gillray (1756-1815), Thomas Rowlandson (1757-1827), and George Cruikshank (1792-1878), produced thousands of satirical drawings, etchings, and engravings which were published as single prints and in books. They were all influenced by the earlier work of William Hogarth (1697-1764), whose work as a painter and engraver was strongly moralistic and only occasionally depicted doctors. Rowlandson and Cruikshank drew much of their inspiration from English urban life, especially from the teeming streets of London, and used the exaggerated features of ordinary people to provide satirical commentary on contemporary events, political and social. The profession of medicine, with its evolving treatments for



maladies not very well understood, its often dramatic situations of life and death, and the considerable degree of quackery with which it was rife provided a natural subject for the satirical pen and brush.

Thomas Rowlandson was born in London and lived there for the whole of his life. He was trained as an artist at the Royal Academy Schools and there developed his superior skills as a draughtsman. Before the French Revolution he made several trips to Paris and absorbed French artistic practices, especially the use of watercolour. He was apparently an easy-going, convivial man, chronically in debt, and thus a prolific artist who produced almost 10,000 drawings, many of them for books published by Ackermann. Among these were many depicting medical scenes.

- 1 I have a secret art to cure Each malady, which men endure (1814)
- 2 The Doctor's sickning toil to close Recipe Coffin, is the Dose (1814)
- 3 Wonderfully Mended (1808)
- 4 Dropsy Courting Consumption (1810)
- 5 Medical Dispatch or Doctor Doubledoes Killing Two Birds with One Stone (1810)



During the course of his very long life George Cruikshank also produced an immense quantity of work, much of it for the publishers of books. He was also born in London and grew up “cradled in caricature”, as both his father Isaac and his brother Robert were artists with very similar styles. He was taught to draw by his father and by the age of eleven was supplying designs to publishers for children’s books. Most of his medical caricatures were done during the early part of his career and he later became better known for his illustrations for the novels of Dickens and other writers of the mid-19th century.

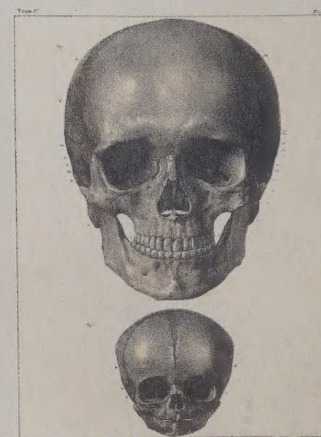
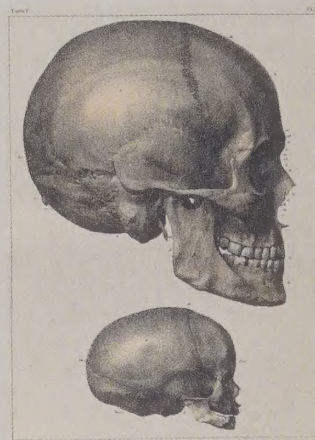
- 1 The Examination of a Young Surgeon (1811)
- 2 The Imposter, or, Obstetric Dispute (1814)
- 3 The Colic (1819)
- 4 Mixing a Recipe for Corns (1822)
- 5 The Blue Devils (1823)

There were many other artists who created medical caricatures. Charles Williams, who flourished from 1797 to 1830, was a follower of Gillray and his “The Physician’s Friend” was produced during the early part of this period. George Woodward (1760-1809) who was associated with Rowlandson, produced his “The Sailor and the Quack Doctor” early in the 19th century, but it may not have been etched until after his death.

These medical caricatures are from the collection of Dr. Charles Godfrey, given to the Thomas Fisher Rare Book Library in 1983.







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